

FINANCIAL and RISK ANALYTICS

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PROBLEM STATEMENT

- **Growth of Wealth Management:** The industry has expanded as individuals and businesses seek maximum returns on investments
- **Investor Challenges:** Many investors lack the skills or time to identify profitable investment opportunities.
- **Portfolio Managers:** Professionals who manage investments on behalf of clients in exchange for a commission, handling investment decisions and portfolio management
- **Responsibilities:**
 - Establish investment strategies
 - Select appropriate investments and allocate assets accordingly



OUR ROLE

- As an associate at an investment firm, we analyze stock portfolios to offer investment management advice based on client's financial requirements.



BUSINESS REQUIRE- MENT

- To offer investment management consultation, we analyze stock portfolios for private clients based on their requirements and financial objectives.
- Information on **24 stocks of leading companies** in different domains like **aviation, finance, pharma healthcare, and technology** listed in the **New York Stock Exchange (NYSE)** from 1st October 2010 to 30th September 2020 are available including S&P50
- To identify important insights from stock market analysis and, as a result, create a portfolio for **Mr. Patrick and Mr. Peter**
- To understand the investors' profiles to provide an appropriate investment plan.
- To meet the expectations of the investors, we must ensure that:
 - ✓ Mr. Patrick's investment will **double in the next 5 years** (low risk, high returns).
 - ✓ At the same time, we need to ensure that Mr. Peter's cash flow will also **double in 5 years** (ready to take risks, high returns).



CLIENT'S FINANCIAL REQUIRE- MENTS

Mr. Patrick Jyengar

Wants to maintain a decent standard of living post his retirement.

Has always been a conservative investor during his life

Available capital of \$1 million; Wants to invest \$500K in a magazine (Natro) for minority stake and remaining \$500K in equities

Expects doubling his capital with less risk in 5 years' time to buy a minority portion of Naturo

Mr. Peter Jyengar

Consistent with his attitude towards risk, he prefers high-return investments

Believes that he can still bounce back in case of any occasional losses

Wants to invest \$1 million from company's cash and cash equivalents in the most high-margin stocks

Expects high returns within 5 years for inorganic expansion of JWW

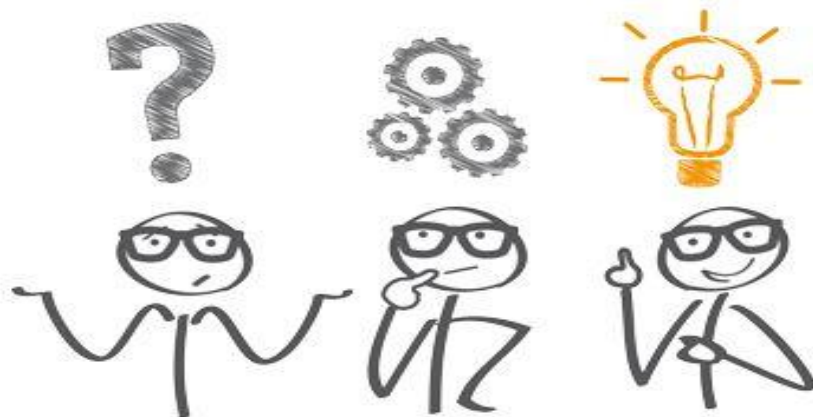
PRIMARY GOAL

- Being a portfolio manager, the task is to provide consultation to two different investors as private clients
 1. Mr. Patrick Jyengar
 2. Mr. Peter Jyengar
- To provide **Mr. Patrick** with a recommended stock portfolio based on his risk profile to achieve his goal of doubling **\$500k in 5 years to purchase a minority stake in nature.**
- To provide Mr. Peter with a high-risk stock based on his risk profile to help him achieve greater returns on his **\$1 million investment over a five-year timeframe.** The purpose of this investment is to support the expansion of JWW.

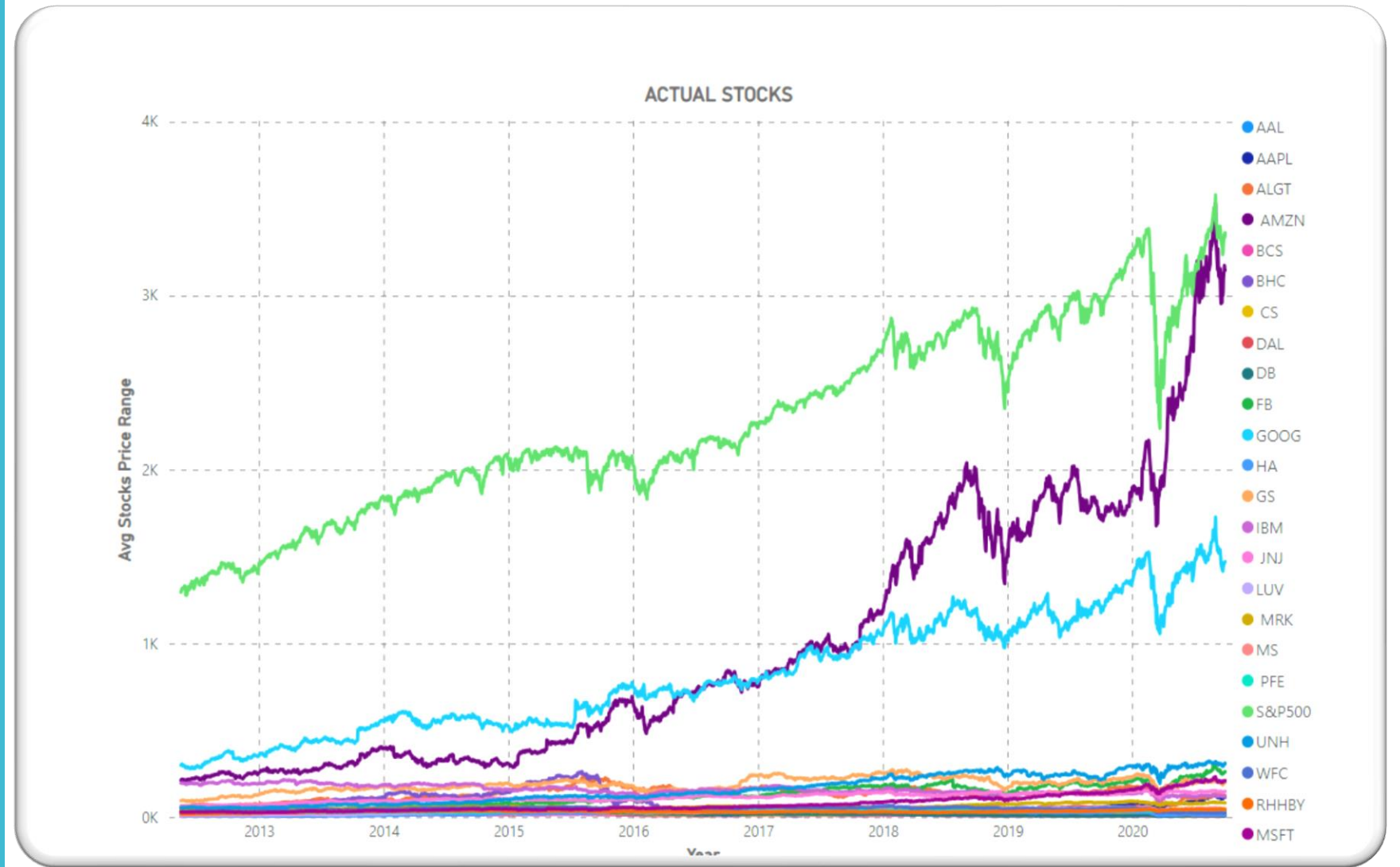


DATA PREPARA- TION and ANALYSIS:

- The 24 datasets of stock files, as well as market index (S&P500) datasets, were imported and combined into a single dataset with a 5-year timeframe.
- The final dataset has been executed by industry, close price and volume
- Using [Plotly](#) and [Tableau](#), visualize the data to get insights between actual stock visualizations and Normalized Stocks
- Calculated annual return, [annual risk](#), [cumulative return](#), and [Sharpe ratio](#) or [risk-adjusted returns](#) using Python matrices
- We provide a suitable investment strategy for both investors based on the outcomes



ACTUAL STOCKS



The overall trend of “actual stocks”

1) AMAZON:

- Shows exponential growth after 2016 with a sharp increase in stock price and some volatility present around 2019-2020 but remains the strongest performer

2) S&P500:

- Consistent and steady upward trend over the years with minimal fluctuations in stability

3) MSFT:

- Stable, continuous growth from 2016 onward
- As mirroring rise and demand for cloud computing and software solutions

4) FB:

- Showing an upward trend around 2016 but with some noticeable fluctuations toward 2020

5) Tech Dominance:

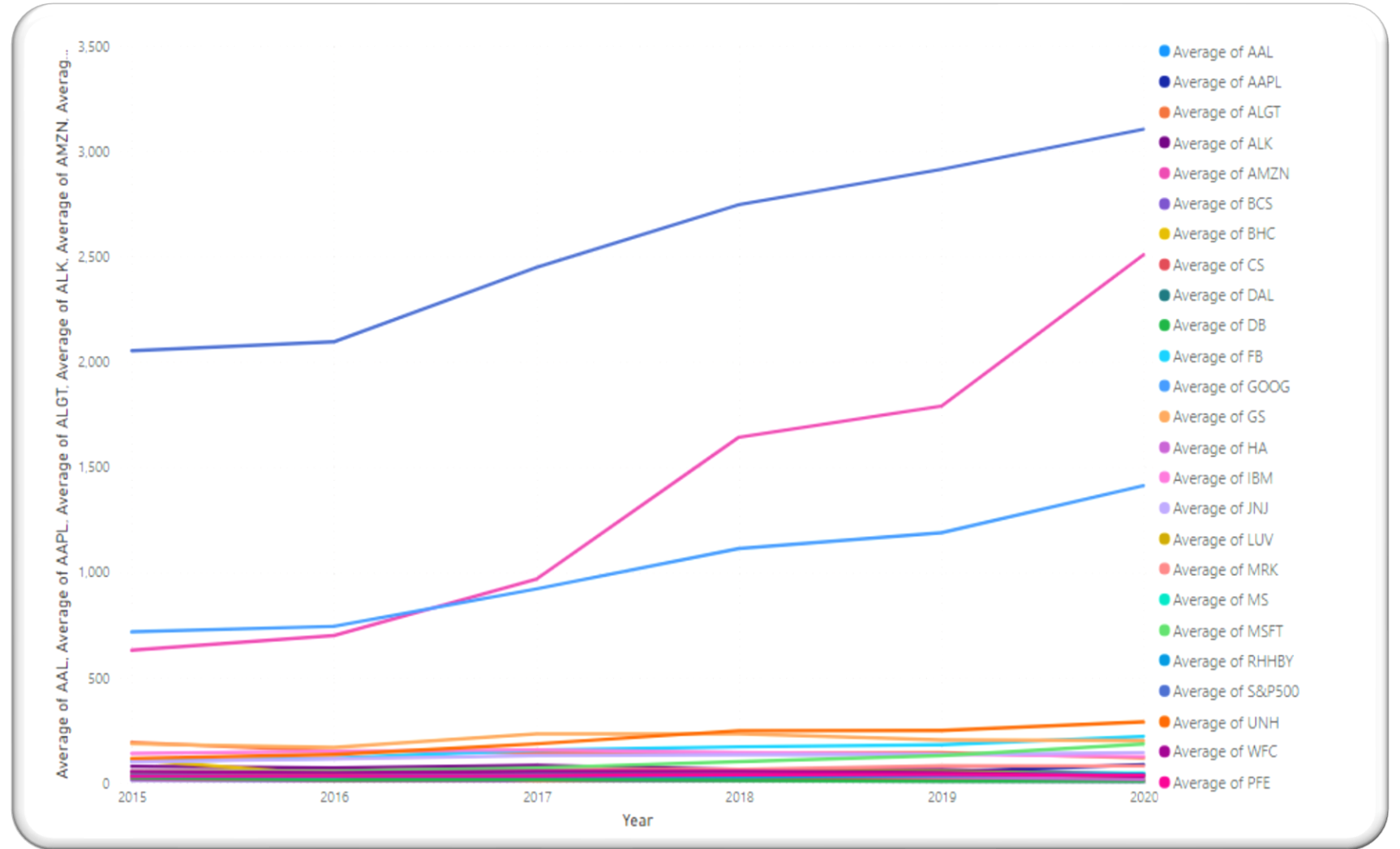
- Like AMZN, MSFT, and GOOG have a clear upward trajectory

6) Non-Tech Stocks :

- These stocks show flatter and minimal growth over the years
- Less dynamin performance compared to tech giants



NORMALIZE - STOCKS



Trends displayed by each year: Normalize stocks

1) 2015:

- **Amazon** starts to show significant growth, distinguishing itself from the rest of the stocks
- Apple shows upward trend
- **MSFT, GOOG, and JNJ** show minimal growth indicating a steady market

2) 2016:

- AMZN continues upward momentum as a leading performer
- GOOG and MSFT show clear growth with their upward curves
- **AAPL maintains its strong market presence** while JNJ and UNH show some trends but, remain slow compared to tech giants

3) 2017:

- FB begins to exhibit noticeable growth this year
- Other **stocks AAPL and JNJ remain steady**

4) 2018:

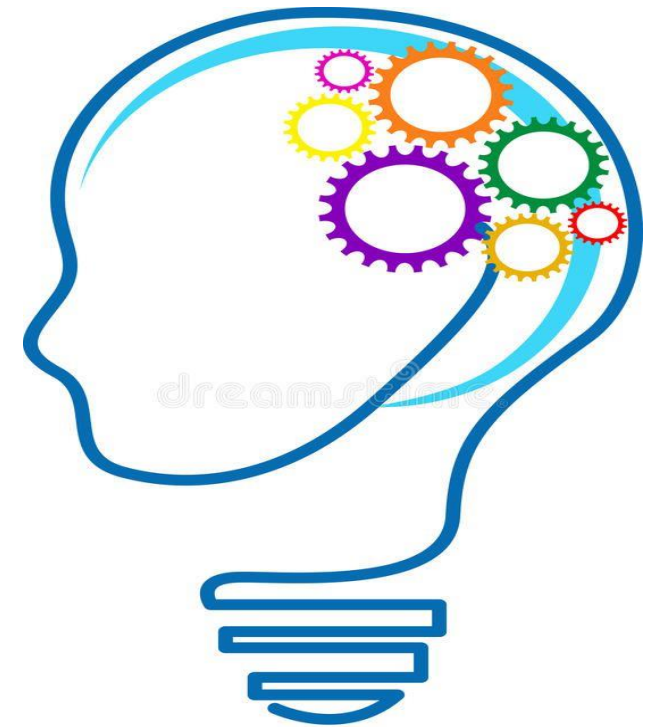
- **AMZN reaches new heights**, with a sharp upward trajectory
- GOOG, MSFT & FB maintains growth
- Most **other stocks remain relatively stable** or have slow growth

5) 2019

- AMZN, GOOG, MSFT, etc. Shows the same trend
- Non-tech stocks exhibit much slower growth, compared to tech companies

6) 2020:

- **AMZN reaches peak** ahead of competition
- GOOG and MSFT showing an **upward trend**
- **AAPL and FB maintain steady growth**



DAILY STOCK RETURNS

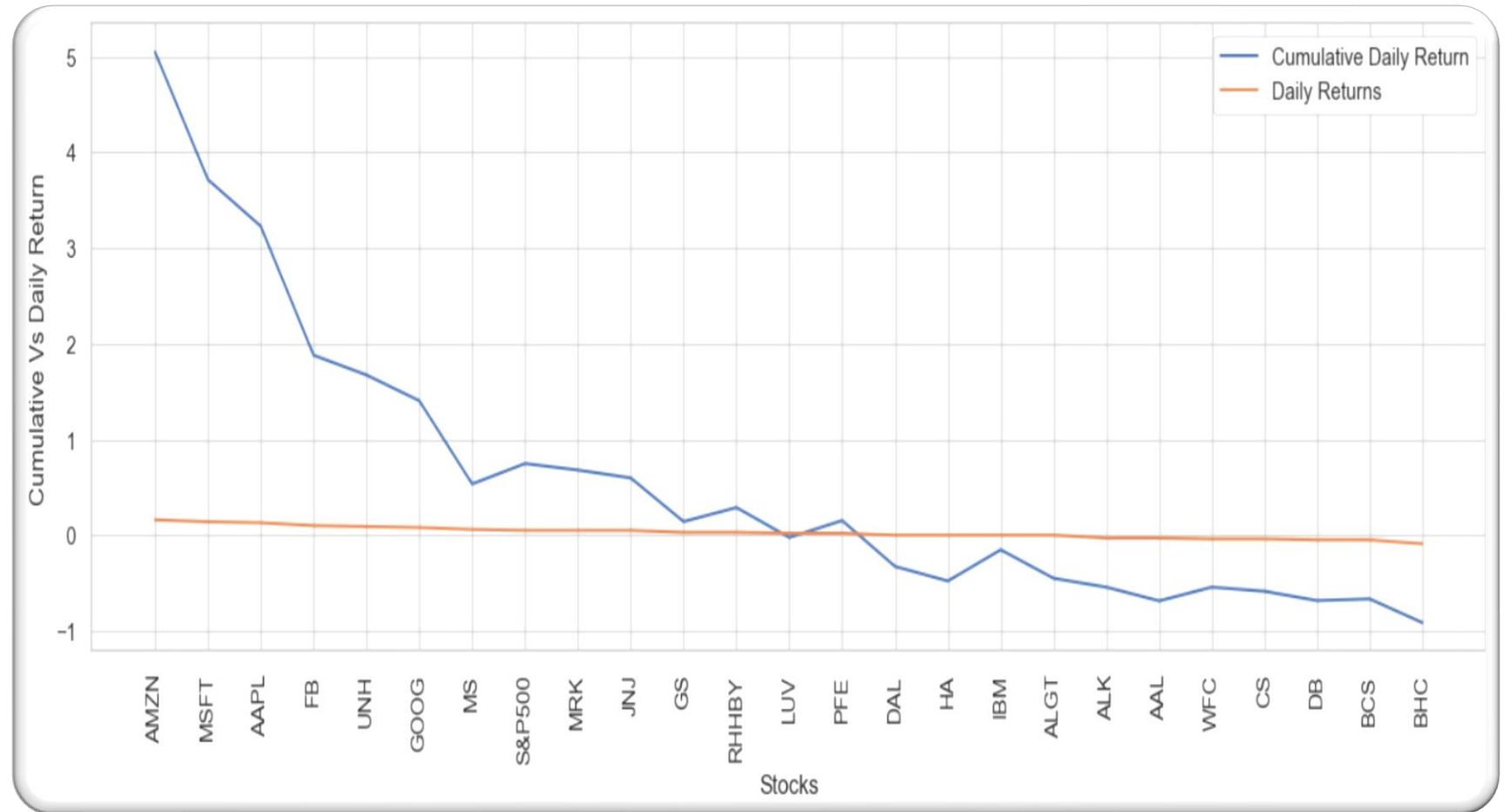


Trends Shown By Daily Stock Returns

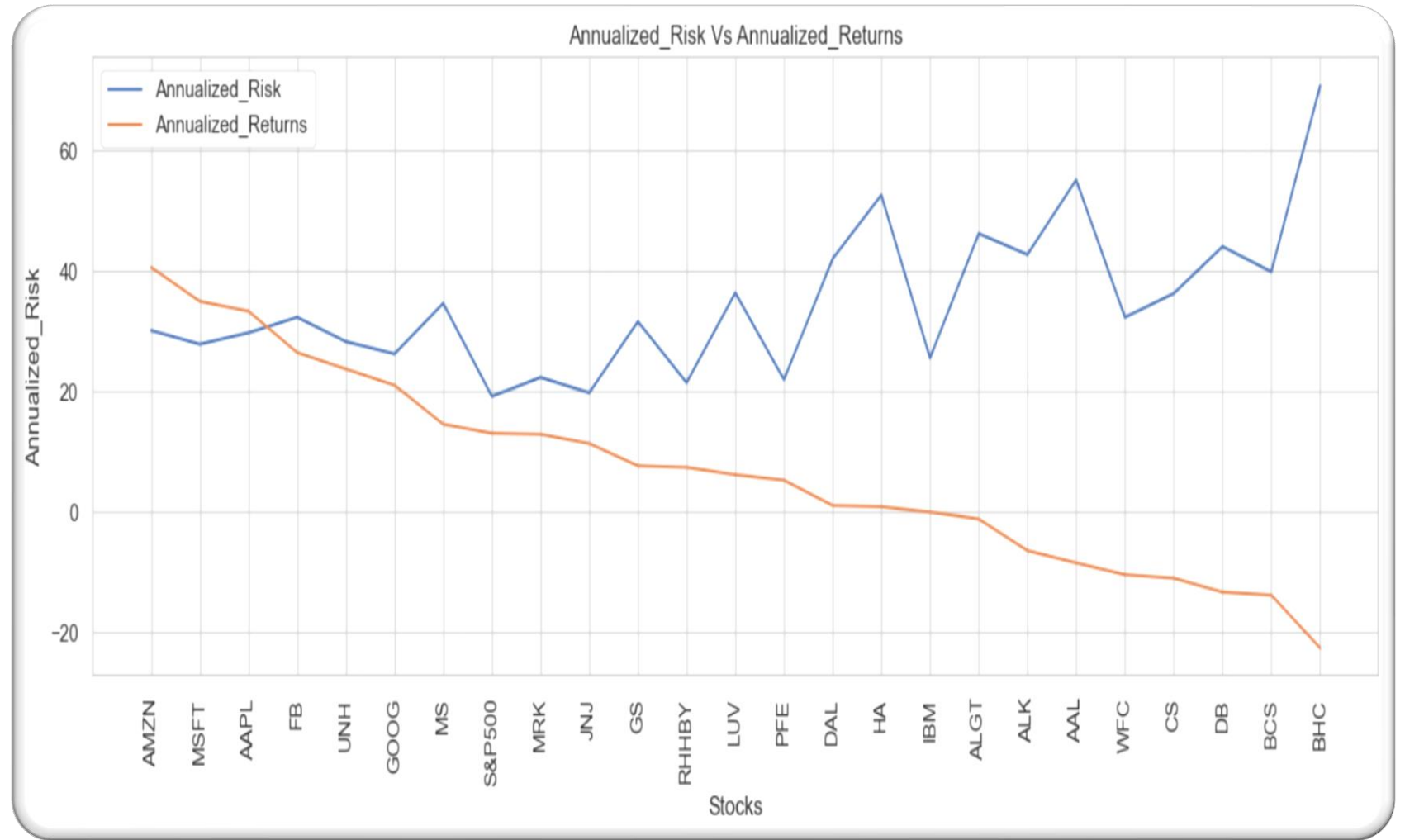


1. Most stock returns across all **companies fluctuate around zero** with normal day-to-day price movements
2. Notice **distinct spikes and drops** during late 2018 and early 2020 due to the **COVID-19 pandemic**
3. AAPL and AMZN show higher fluctuations than other companies while FB, JNJ, and GOOG are **relatively stable** with lower volatility
4. MSFT and SP500 **show smoother variations** implying more stability of broader market movements
5. **COVID-19 Impact (2020):** Stocks such as RHHBY and UNH show sudden and significant volatility spikes around early 2020, likely **reflecting market instability** due to the pandemic
6. The SP500, representing a broader index, shows less volatility than individual stocks.

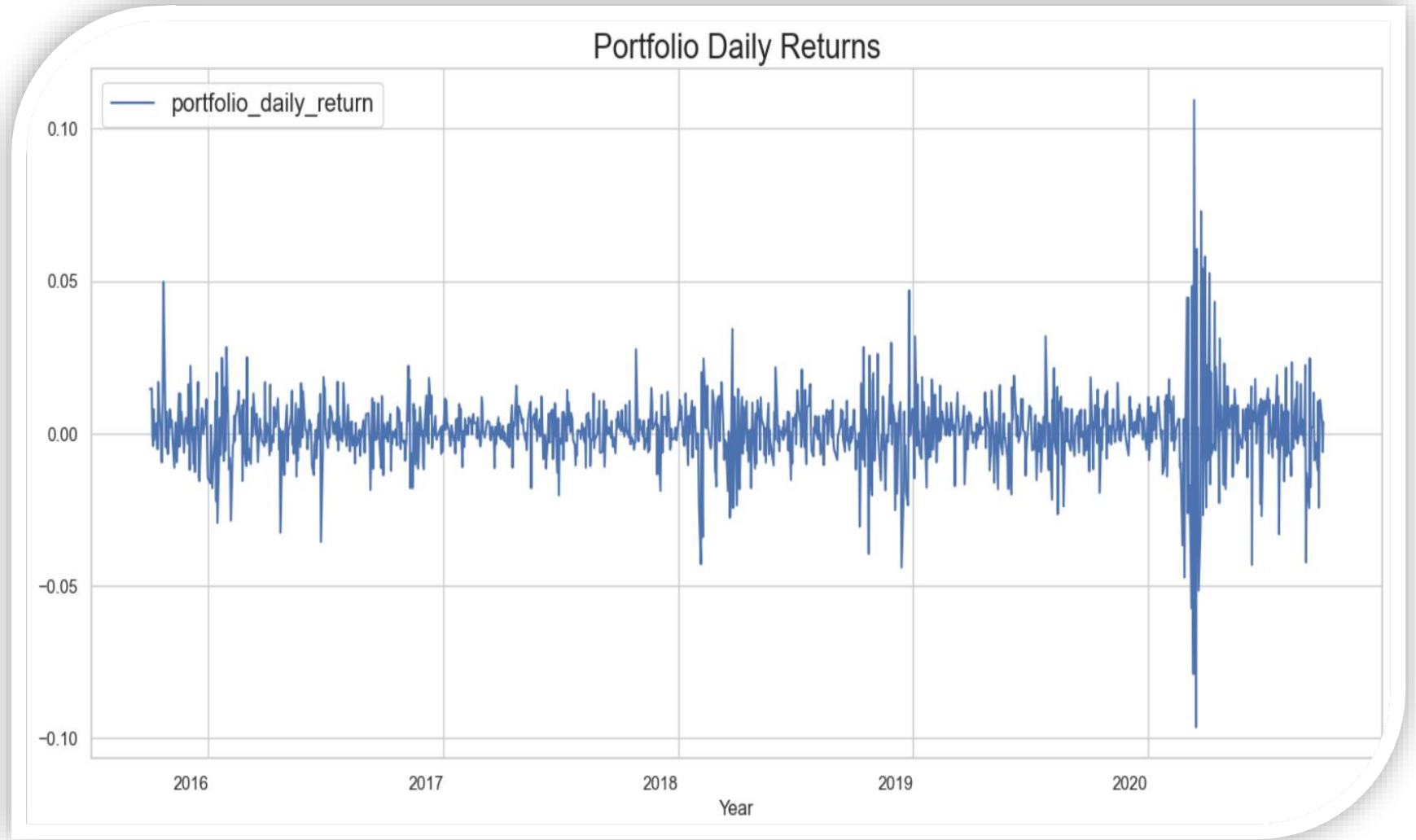
Cumulative v/s Daily Return



Annualized Risk v/s Annualized Returns



Mr. Patrick's Portfolio: Daily Returns



Patrick's Daily Returns Trends

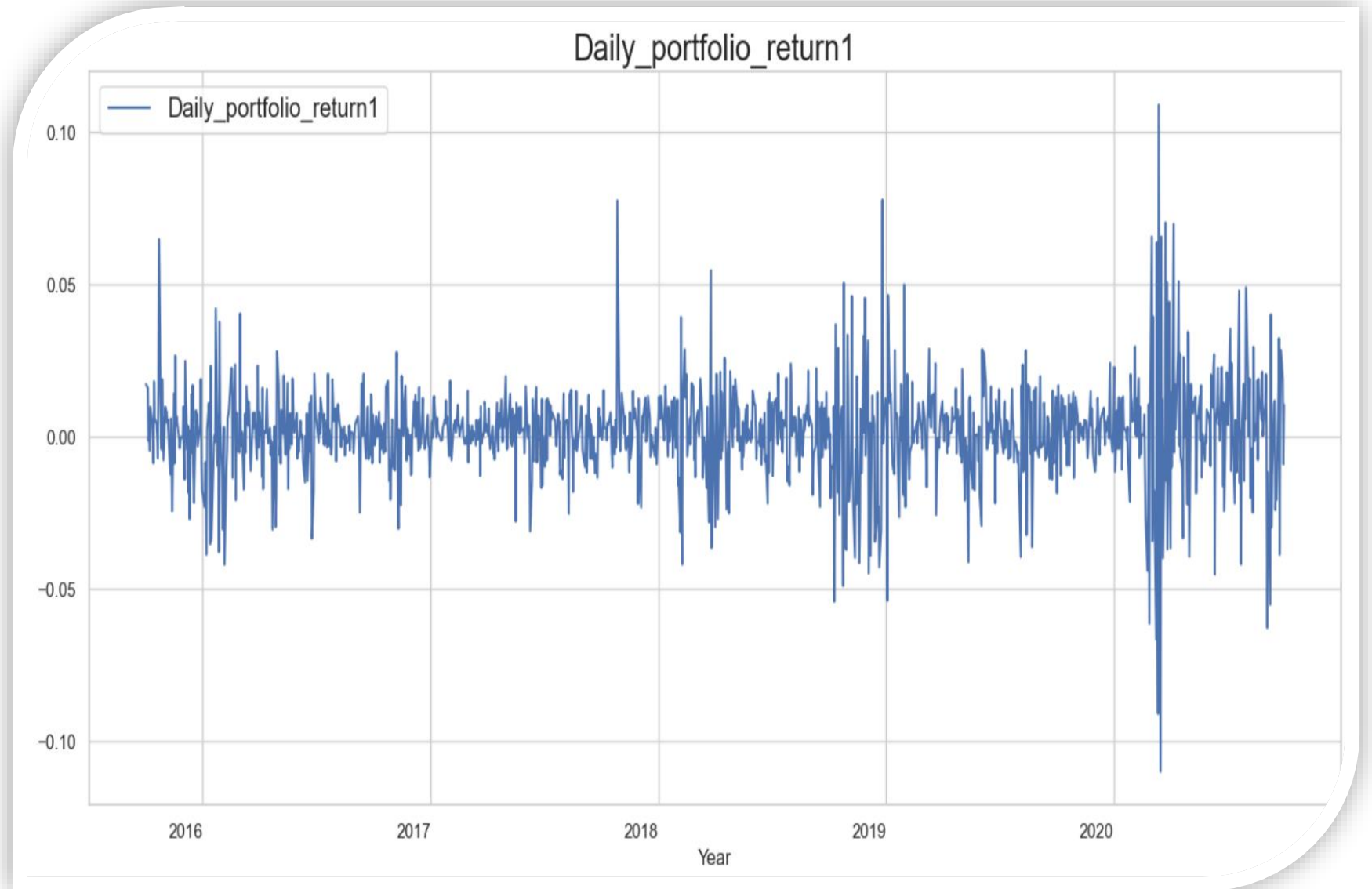


- Showing **general stability from 2016-2019**, the daily returns fluctuate around zero indicating low volatility during this period
- A significant **positive and negative daily returns spike** occurs around early 2020 (between 0.1 and -0.1). This is due to market turmoil **during the COVID-19** pandemic which caused large swings in returns
- **Pre-Crisis Calm:** Before 2020, the returns were around zero, suggesting the portfolio **experienced normal market fluctuations** without major disruptions
- **Post-Volatility Decline:** After the extreme volatility in 2020, the **returns gradually stabilize** and remain more volatile

CONCLUSIONS :

This chart suggests that the portfolio was relatively stable until the market shock in 2020, after which it experienced increased volatility but eventually returned to a more stable state.

Mr. Peter's Portfolio : Daily Returns



Peter's Daily Returns Trends

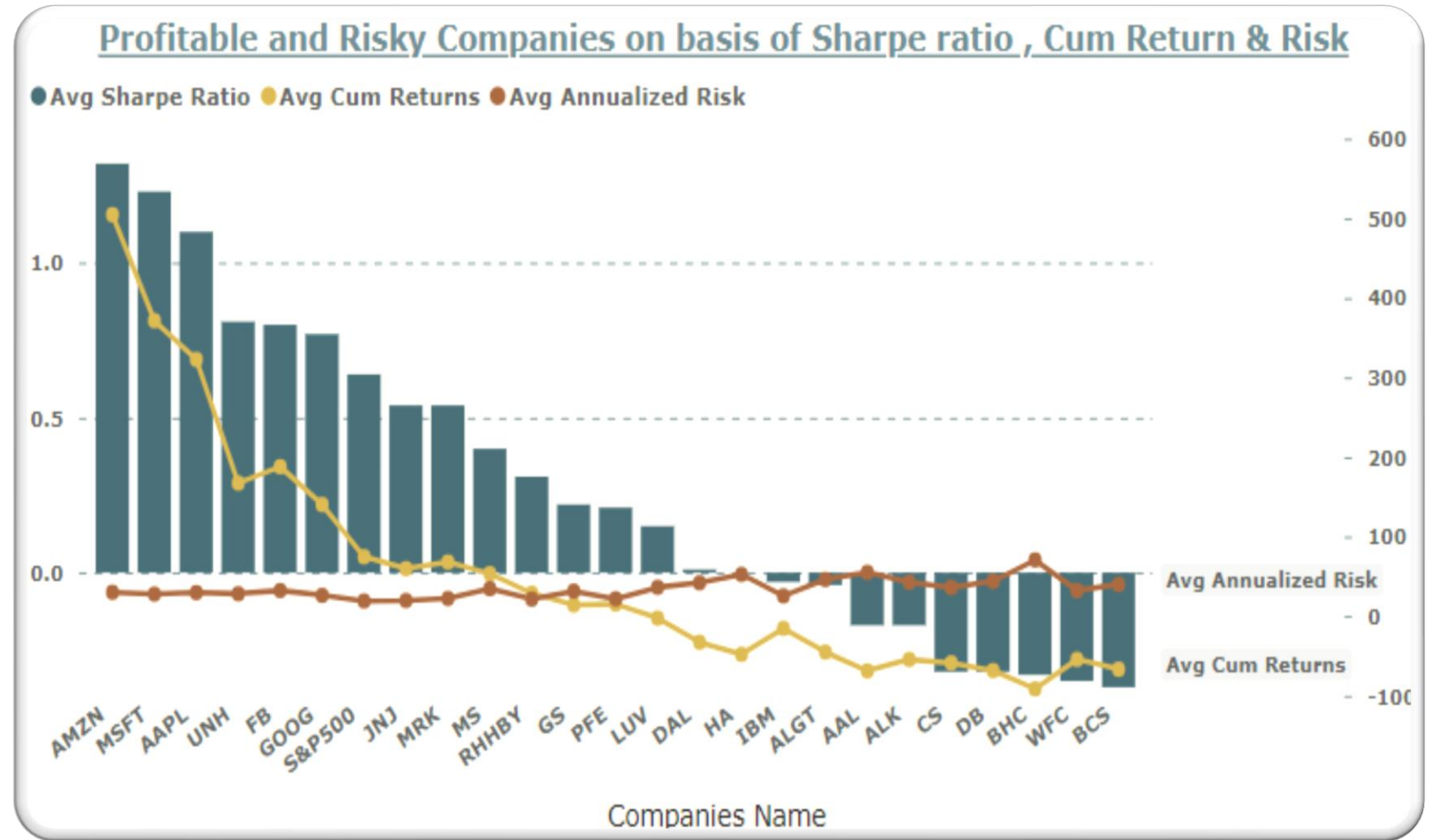
- From 2016 to 2018 the portfolio shows low **volatility and steady performance** with minor fluctuations around zero
- In late 2018, the portfolio showed an increase in daily return variability which likely reflects **potential economic uncertainties** during that period
- Around early 2020, there are major spikes in both directions (**+ve and -ve**). This reflects the **impact of COVID-19 on the financial market**
- Post-2020 there is a gradual stabilization and volatility starts to reduce though returns remain more variable compared to the stable period (2016-2018)

CONCLUSIONS:

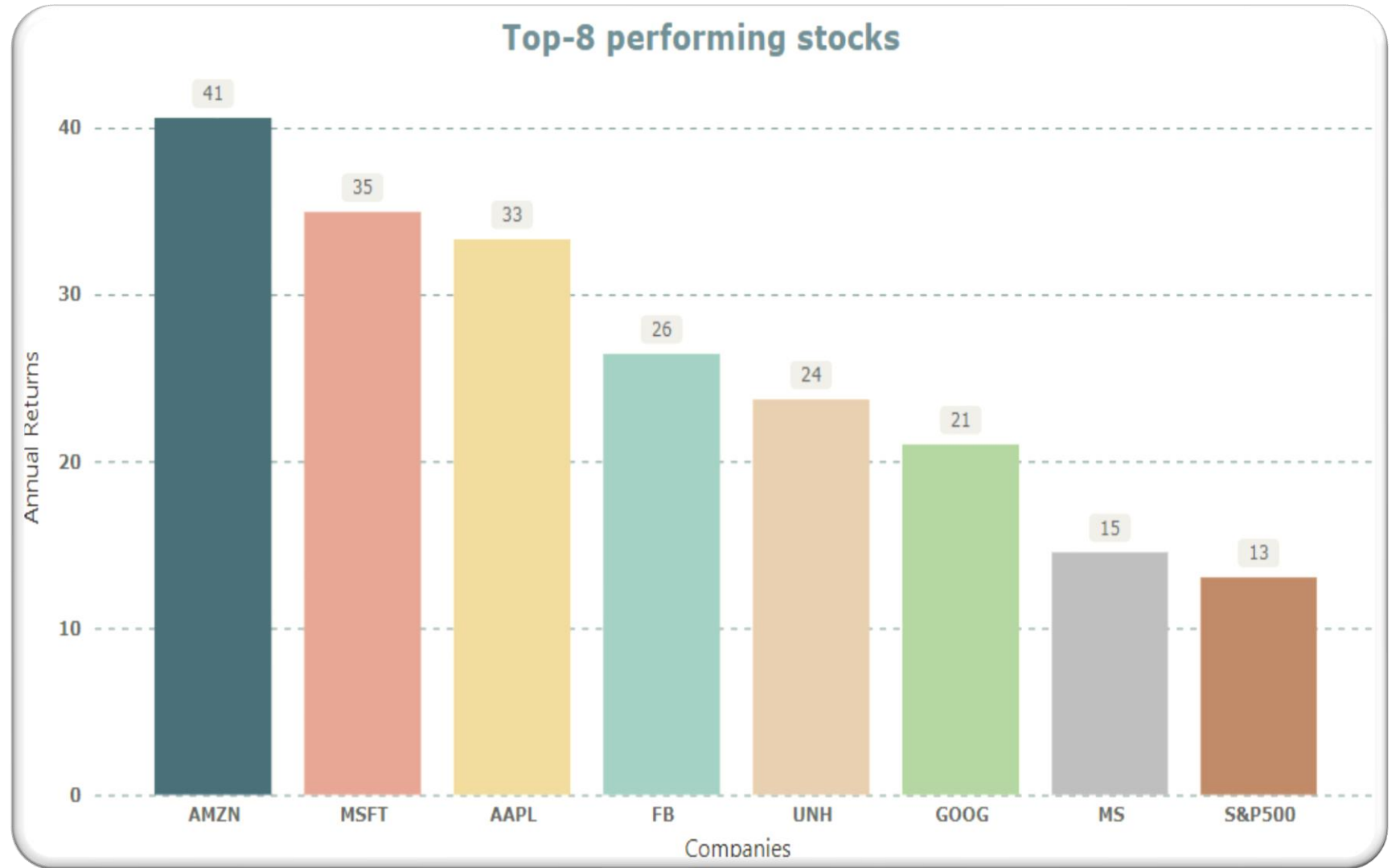
Overall, the portfolio was relatively stable before 2019, experienced a period of heightened volatility during the pandemic, and started stabilizing afterward.



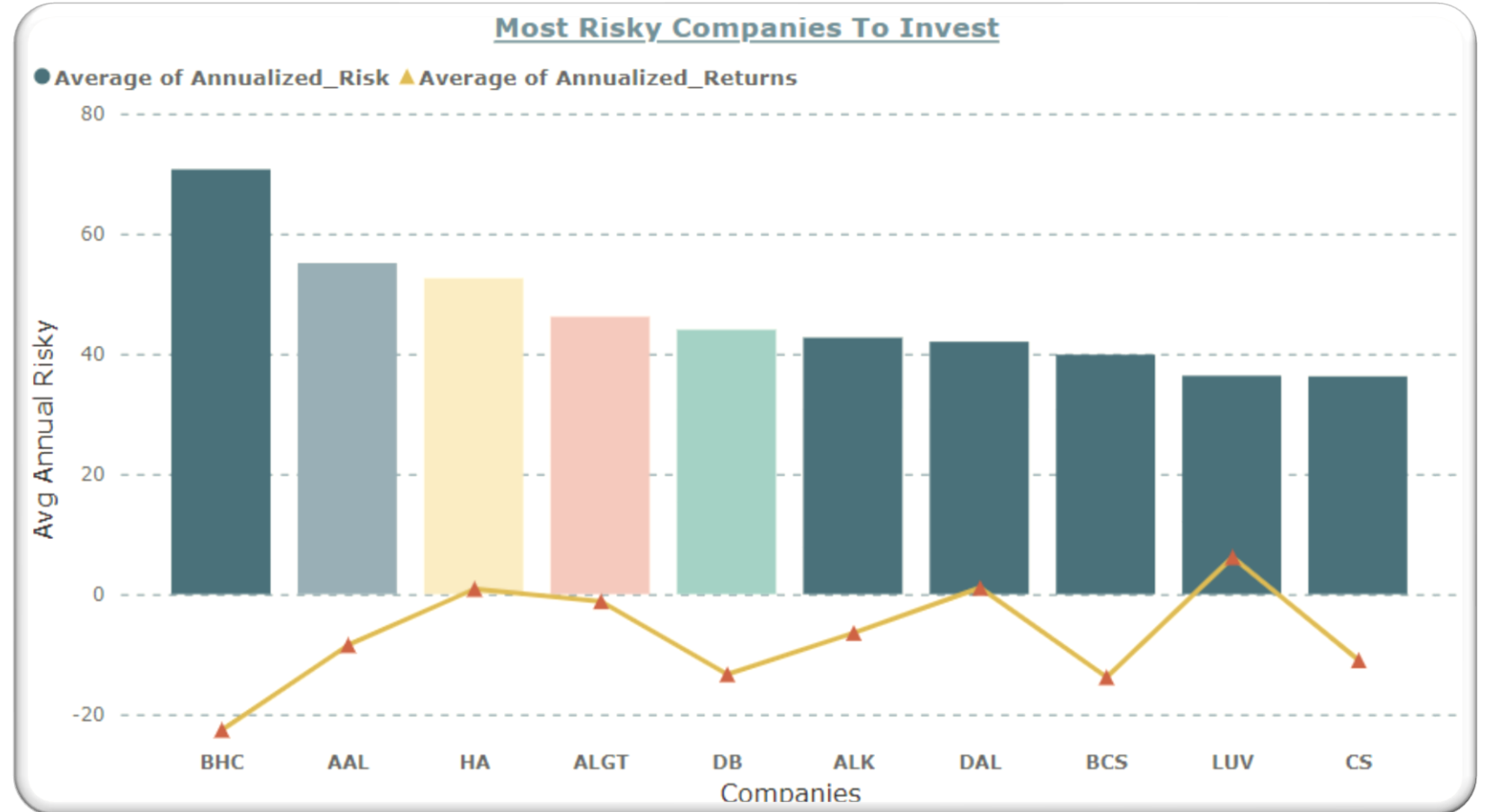
Profitable and Risky Companies



TOP-STOCKS



Most Risky Companies To Invest



WHAT NEXT.....

- Now we will see the data according to our client's portfolio needs and conclude.
- Finally, we will advise our clients on which companies they should invest in to make their investments profitable in the long run.



LET'S TALK

Mr. Patrick's: companies to invest according to financial profile



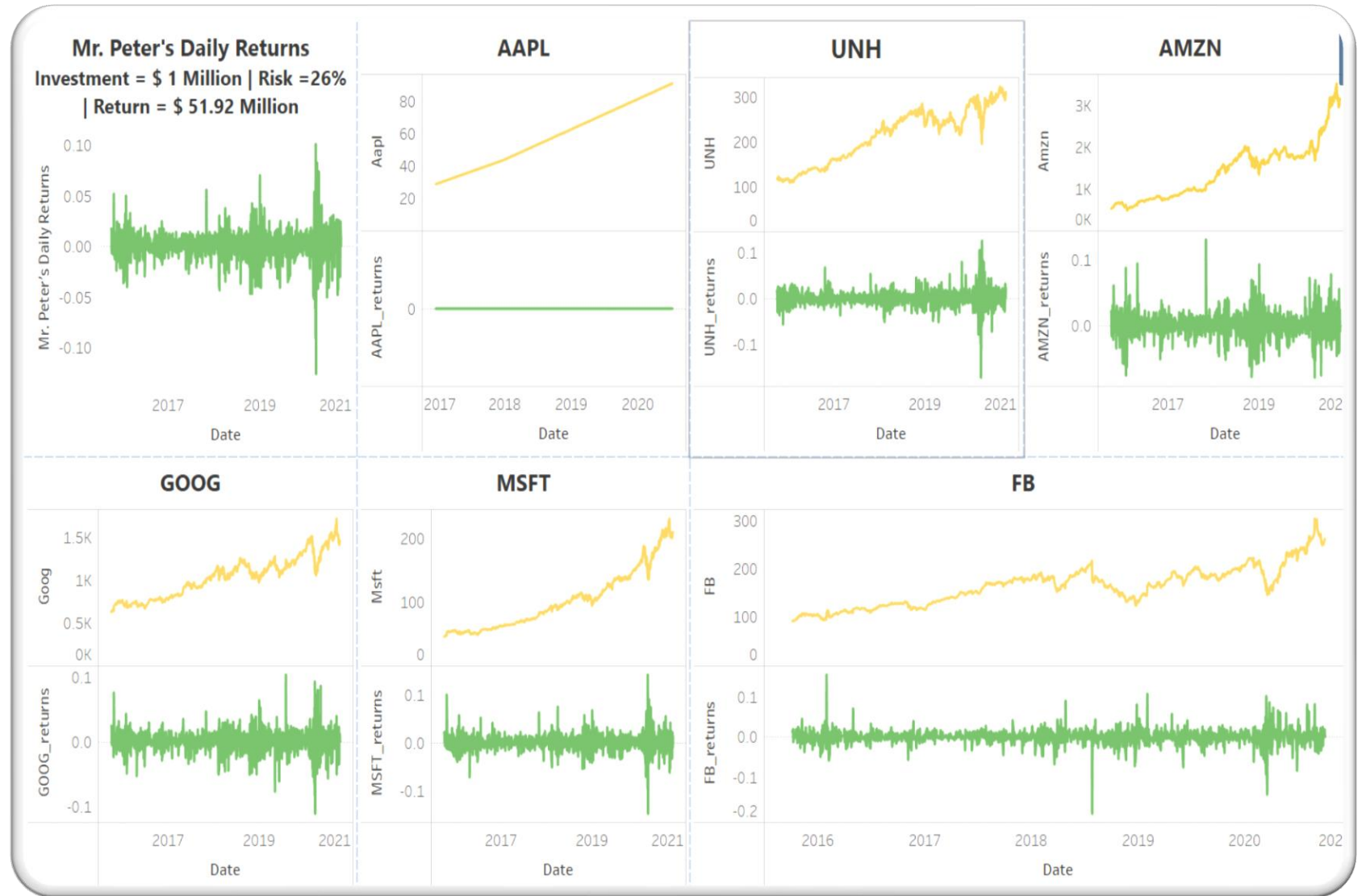
CLIENT -1: conclusion

- The following can be advised based on the level of risk an investor is prepared to take:
 - **For Mr. Patrick's Jyengar:** The estimated portfolio returns for JNJ, RHHBY, PFE, and MRK stocks is **\$1.158 Million** with a risk of 19.20% which is near the S&P500 risk index which is **19.20%**
 - Therefore, we recommend Mr. Patrick Jyengar invest the amount in the below stocks equally to get **2.4X** returns with a risk of 19.20%
1. **Johnson & Johnson**
 2. **Roche Holding AG**
 3. **Pfizer Inc.**
 4. **Merck and CO inc.**



Invested Amount	Expected Return	Expected Earning	Total Portfolio Return	Average Portfolio Risk
500000	11,57,514.11	6,57,514.11	0.93	0.19

Mr. Peter's: companies to invest according to financial profile



CLIENT-2: conclusion

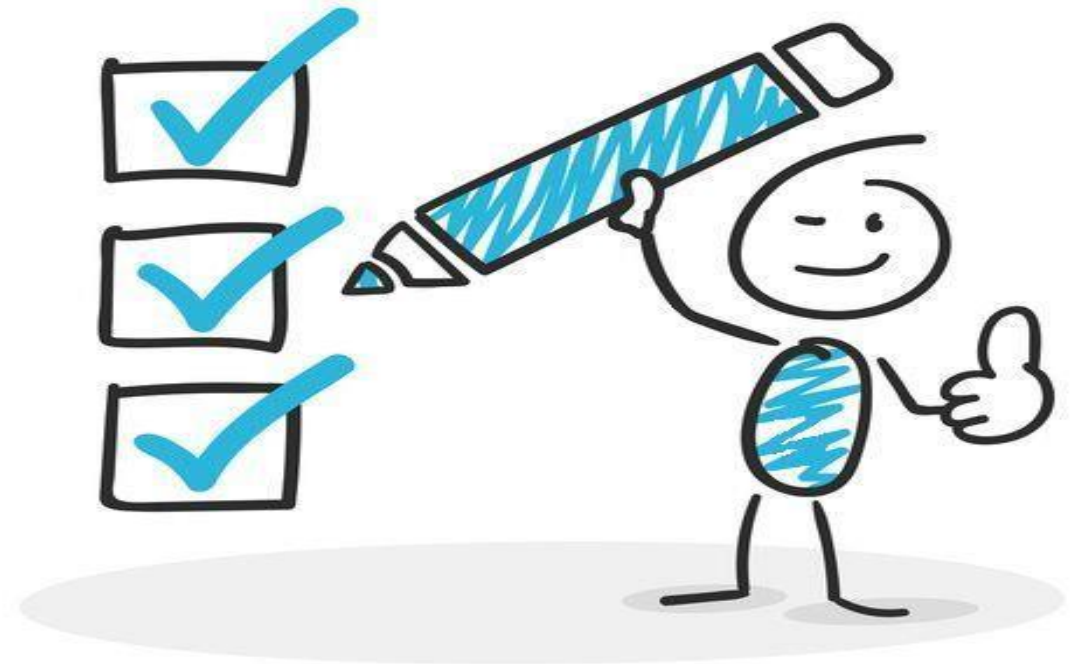
- The following can be advised based on the level of risk an investor is prepared to take:
 - **For Mr. Peter's Jyengar:** The estimated portfolio returns for AMZN, MSFT, AAPL, FB, UNH, and GOOG stocks is **\$51.92 Million** with a risk of **26%**
 - Therefore, we recommend Mr. Patrick Jyengar invest the amount in the below stocks equally to get 4X returns with a risk of **26%**
1. Amazon
 2. Microsoft
 3. Apple
 4. Facebook
 5. United Health Group Inc
 6. Google



Invested_amount	Expected_Return	Expected_Earning	Total_portfolio_return	Portfolio_risk
1000000	51,91,744.34	41,91,744.34	0.00	0.26

END

THANK YOU



Presentation video link

<https://docs.google.com/document/d/1u2foPB3A3LgcLzk3oKxr1Z53nTH-44GPdfodzZJ4JsE/edit?usp=sharing>