

Portfolio Recommendations for Patrick & Peter Jyengar

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DS_C28 FINANCE AND RISK ANALYTICS - CAPSTONE PROJECT

Portfolio Recommendation

Mr Patrick Jyengar : \$ 500 K (after investing in Naturo)

50% Amazon
50% Microsoft

Mr Peter Jyengar : \$ 1 million K

50% Amazon
25% Microsoft
25% Apple

We will discuss in the following slides how we have reached this conclusion.

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 (Naturo) 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

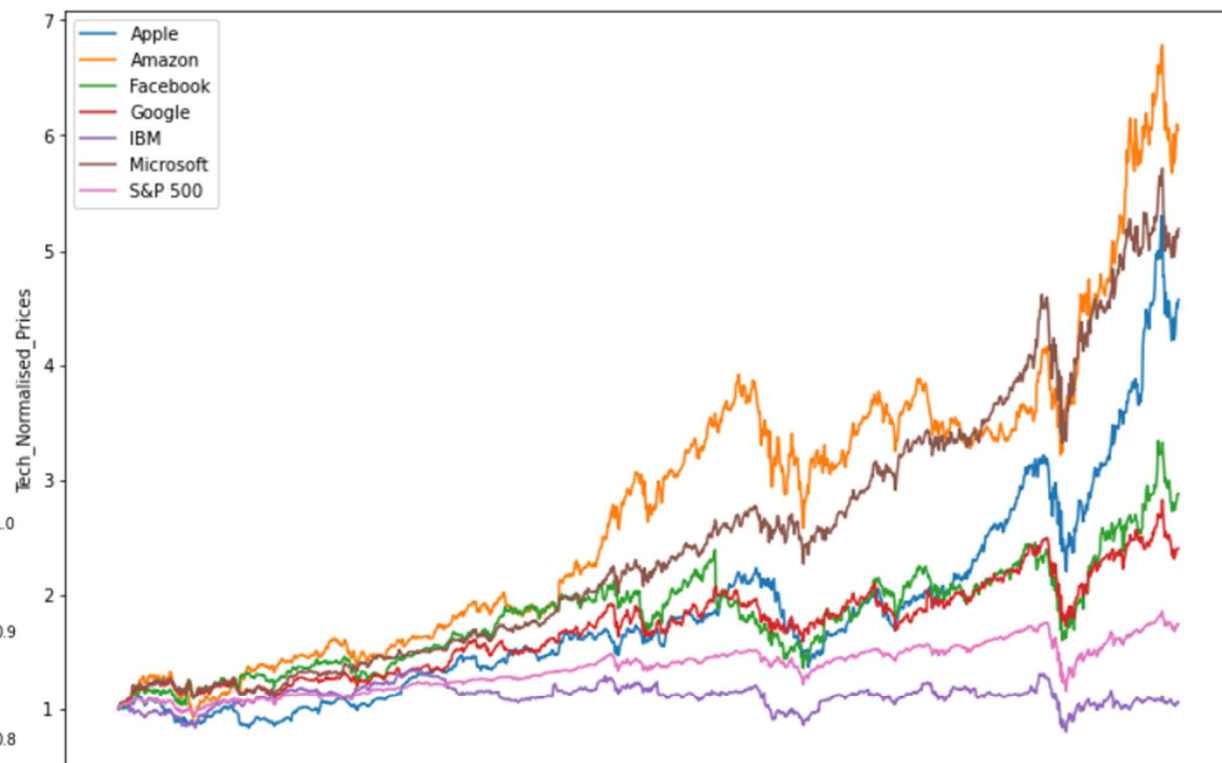
Believes that he can still bounce back in case of any occasional losses

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

Tech Stocks Analysis

We analysed the tech sector stocks for the key statistical metrics like daily returns, visualising the normalised stock values, correlation among the sector & with the market index.

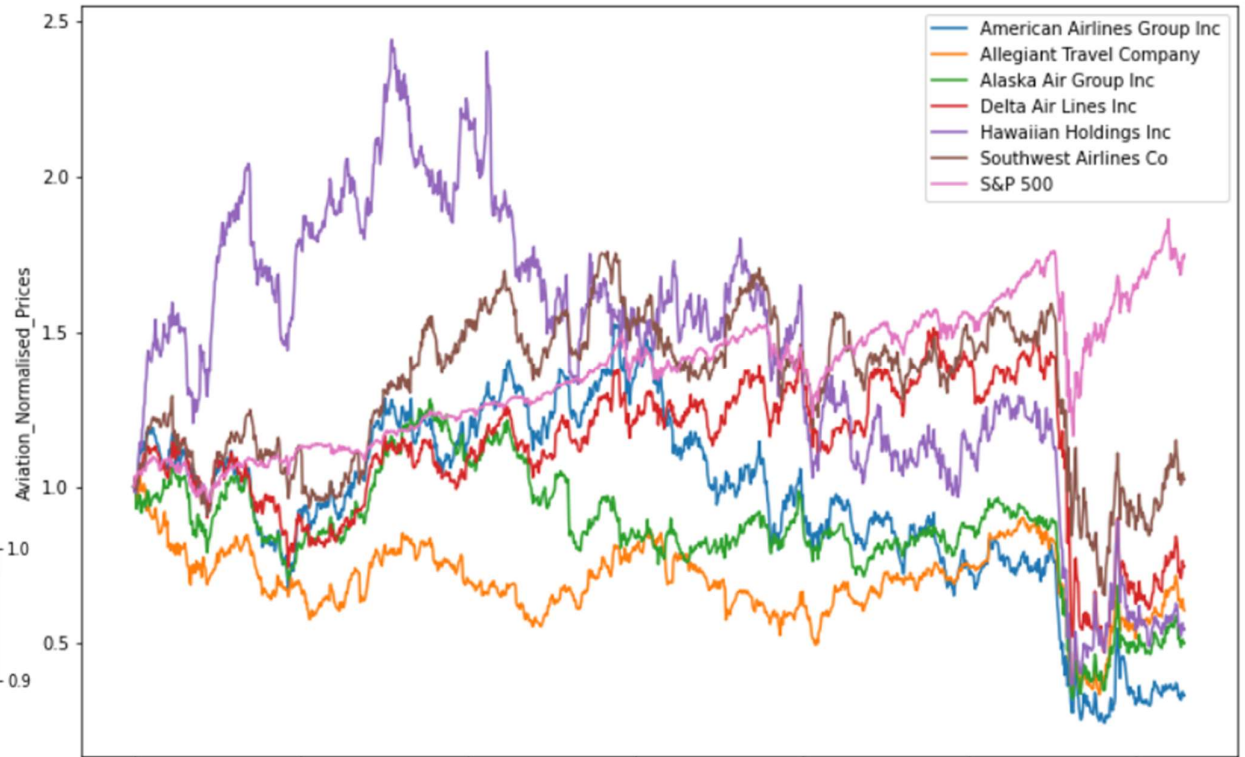
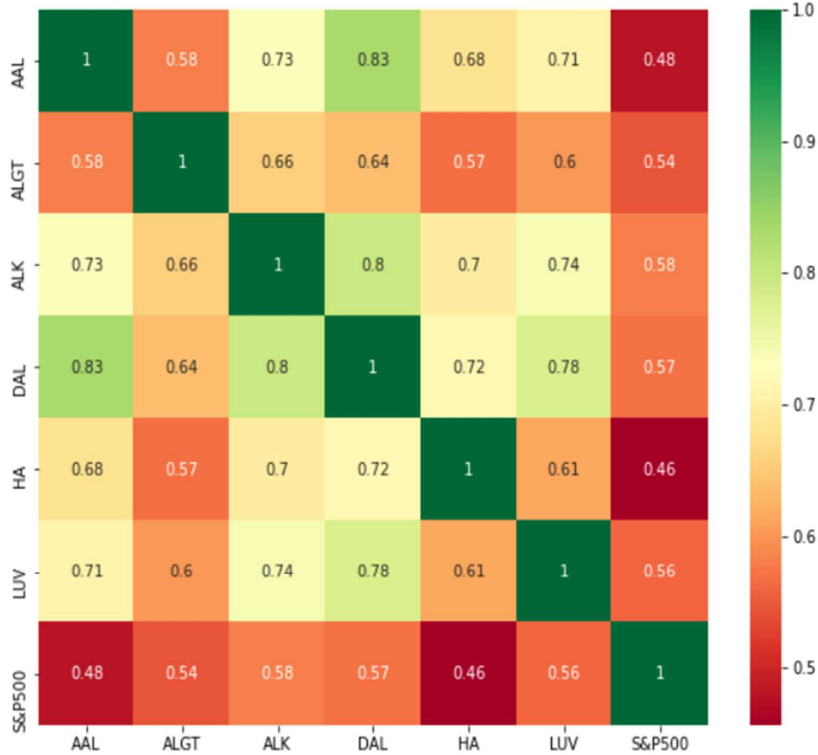


	AAPL	AMZN	FB	GOOG	IBM	MSFT	S&P500
count	1258.000000	1258.000000	1258.000000	1258.000000	1258.000000	1258.000000	1258.000000
mean	0.001385	0.001611	0.001050	0.000834	0.000174	0.001463	0.000517
std	0.018713	0.018969	0.020354	0.016520	0.016023	0.017526	0.012080
min	-0.128647	-0.079221	-0.189609	-0.111008	-0.128507	-0.147390	-0.119841
25%	-0.005919	-0.006716	-0.007223	-0.005788	-0.006227	-0.005851	-0.002938
50%	0.001001	0.001636	0.001193	0.000973	0.000553	0.001301	0.000682
75%	0.010018	0.010765	0.010880	0.008785	0.007004	0.009161	0.005213
max	0.119808	0.132164	0.155214	0.104485	0.113011	0.142169	0.093828

Tech Stocks Returns

Aviation Stocks Analysis

We analysed the aviation sector stocks for the key statistical metrics like daily returns, visualising the normalised stock values, correlation among the sector & with the market index.

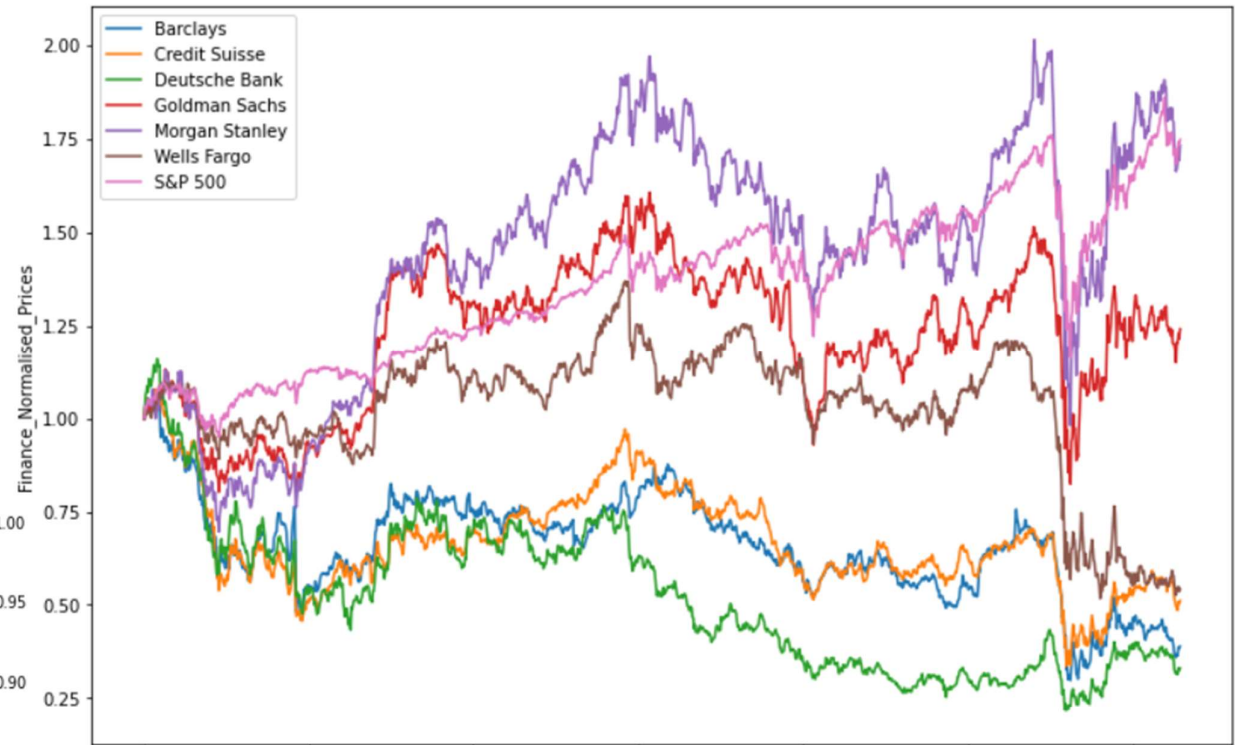
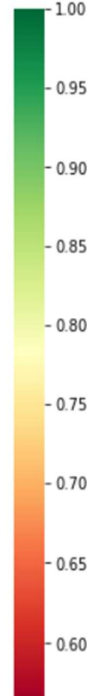
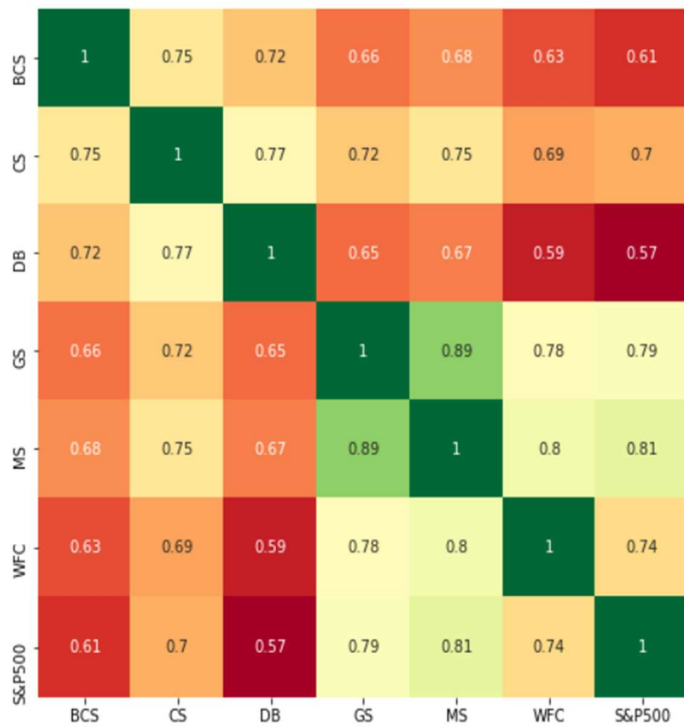


	AAL	ALGT	ALK	DAL	HA	LUV	S&P500
count	1258.000000	1258.000000	1258.000000	1258.000000	1258.000000	1258.000000	1258.000000
mean	-0.000298	0.000025	-0.000189	0.000120	0.000064	0.000281	0.000517
std	0.034723	0.029107	0.026910	0.026473	0.033131	0.022900	0.012080
min	-0.252246	-0.283300	-0.232385	-0.259924	-0.264971	-0.151094	-0.119841
25%	-0.013547	-0.011278	-0.010721	-0.009509	-0.014844	-0.008918	-0.002938
50%	-0.000430	-0.000340	0.000492	0.000801	0.000342	0.000618	0.000682
75%	0.013233	0.011630	0.010619	0.009956	0.015078	0.009990	0.005213
max	0.410970	0.292428	0.203079	0.210171	0.245837	0.144441	0.093828

Aviation Stocks Returns

Finance Stocks Analysis

We analysed the finance sector stocks for the key statistical metrics like daily returns, visualising the normalised stock values, correlation among the sector & with the market index.

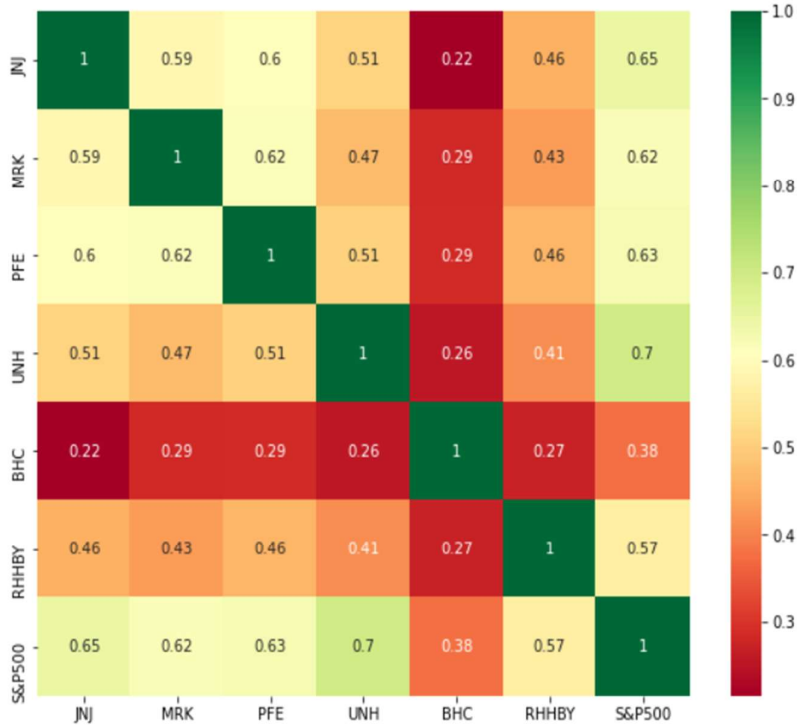
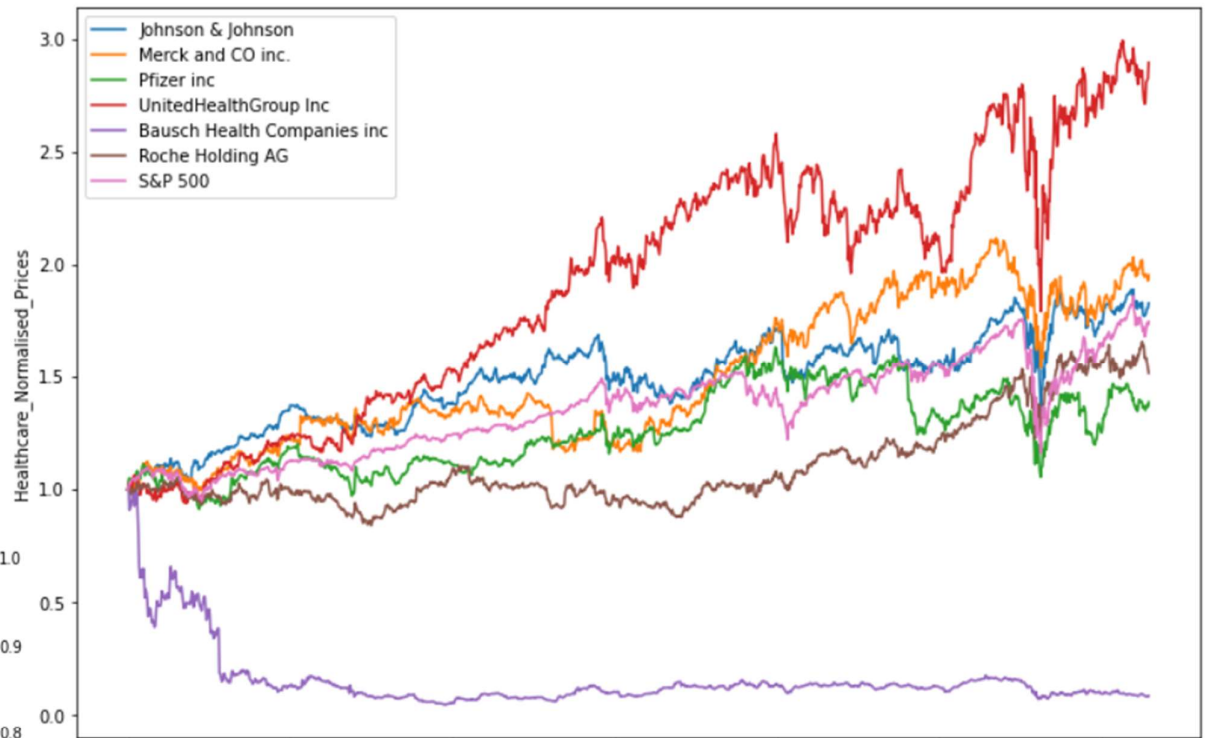


	BCS	CS	DB	GS	MS	WFC	S&P500
count	1258.000000	1258.000000	1258.000000	1258.000000	1258.000000	1258.000000	1258.000000
mean	-0.000431	-0.000271	-0.000498	0.000370	0.000674	-0.000280	0.000517
std	0.025029	0.022788	0.027749	0.019887	0.021813	0.020331	0.012080
min	-0.218519	-0.182598	-0.174888	-0.127053	-0.156000	-0.158676	-0.119841
25%	-0.010690	-0.010309	-0.014936	-0.008323	-0.008882	-0.007852	-0.002938
50%	0.000000	0.000000	-0.001044	0.000369	0.000614	-0.000184	0.000682
75%	0.010215	0.010425	0.013872	0.009771	0.010752	0.007641	0.005213
max	0.151042	0.163447	0.140244	0.175803	0.197700	0.145347	0.093828

Finance Stocks Returns

Pharma & Healthcare Stocks Analysis

We analysed the pharma & healthcare sector stocks for the key statistical metrics like daily returns, visualising the normalised stock values, correlation among the sector & with the market index.



	JNJ	MRK	PFE	UNH	BHC	RHHBY	S&P500
count	1258.000000	1258.000000	1258.000000	1258.000000	1258.000000	1258.000000	1258.000000
mean	0.000558	0.000631	0.000355	0.001005	-0.000897	0.000422	0.000517
std	0.012441	0.014021	0.013743	0.017834	0.044551	0.013492	0.012080
min	-0.100379	-0.088990	-0.077346	-0.172769	-0.514629	-0.089609	-0.119841
25%	-0.004177	-0.006024	-0.005591	-0.006587	-0.019678	-0.005997	-0.002938
50%	0.000632	0.000381	0.000278	0.000864	-0.000501	0.000293	0.000682
75%	0.005945	0.007654	0.006414	0.008271	0.018022	0.006933	0.005213
max	0.079977	0.104080	0.089607	0.127989	0.337444	0.130118	0.093828

Pharma & Healthcare Stocks Returns

Stocks selection for portfolio

Now on the basis of the trends visualised in the graphs & average returns, risk of each stock we shortlisted some of the stocks to analyse further.

However, the aviation sector stocks are not advisable for investing as that sector is hardest hit by the covid pandemic.

We will compare the metrics against the market index and select the stocks on the basis of Sharpe ratio.

A high Sharpe ratio suggests that the reward per unit of risk is high for the investment. Therefore, it is expected that a good portfolio will have a high Sharpe ratio after diversification.

- Sharpe ratio greater than 1.0 is considered acceptable to good by investors.
- A ratio higher than 2.0 is rated as very good.
- A ratio of 3.0 or higher is considered excellent.
- A ratio under 1.0 is considered sub-optimal.

S&P500 Max price: 3580.840088
S&P500 Min price: 1829.079956
S&P500 Avg Return: 0.05174863685834393
S&P500 Risk: 0.012080060469020429
S&P500 Annaulised Return: 0.1304065648830267
S&P500 Annualised Risk: 0.191765014941902
S&P500 Cumulative Return: 0.748084589200948
S&P500 Sharpe Ratio: 0.640922771655002
Goldman Sachs Max price: 260.138916
Goldman Sachs Min price: 129.822266
Goldman Sachs Avg Return: 0.03697268584247676
Goldman Sachs Risk: 0.019886529853207817
Goldman Sachs Annaulised Return: 0.09317116832304144
Goldman Sachs Annualised Risk: 0.31568887458989825
Goldman Sachs Cumulative Return: 0.24156021385996596
Goldman Sachs Sharpe Ratio: 0.2713784843838233
UnitedHealthGroup Inc Max price: 322.371643
UnitedHealthGroup Inc Min price: 101.323212
UnitedHealthGroup Inc Avg Return: 0.100485748541614
UnitedHealthGroup Inc Risk: 0.01783355875166468
UnitedHealthGroup Inc Annaulised Return: 0.2532240863248673
UnitedHealthGroup Inc Annualised Risk: 0.28309896868898543
UnitedHealthGroup Inc Cumulative Return: 1.8946988607353616
UnitedHealthGroup Inc Sharpe Ratio: 0.8679794471269218

Apple Max price: 134.179993
Apple Min price: 21.202499
Apple Avg Return: 0.13846470168546055
Apple Risk: 0.01871250109493453
Apple Annaulised Return: 0.3489310482473606
Apple Annualised Risk: 0.2970517458313237
Apple Cumulative Return: 3.574557928673631
Apple Sharpe Ratio: 1.1493992310728145

Microsoft Max price: 231.649994
Microsoft Min price: 40.541351
Microsoft Avg Return: 0.1462927076243125
Microsoft Risk: 0.017526229333592026
Microsoft Annaulised Return: 0.3686576232132675
Microsoft Annualised Risk: 0.27822026542421874
Microsoft Cumulative Return: 4.188036333569644
Microsoft Sharpe Ratio: 1.2980996285895612

Amazon Max price: 3531.449951
Amazon Min price: 482.070007
Amazon Avg Return: 0.16105339261582255
Amazon Risk: 0.0189685629658208
Amazon Annaulised Return: 0.4058545493918728
Amazon Annualised Risk: 0.30111660201498974
Amazon Cumulative Return: 5.046877698877426
Amazon Sharpe Ratio: 1.322924563860622

Portfolio Selection – Only Tech stocks compatible with goals

As per the above metrics only 3 Tech stocks are compatible with our financial goals.

Namely, Amazon, Apple, Microsoft.

All 3 stock values when normalised over the period of 5 years have performed better than the market index as we can observe by the 2 graphs here.

Cumulative Returns of each stock:

Amazon: 504.7%

Microsoft: 418.8%

Apple: 357.5%

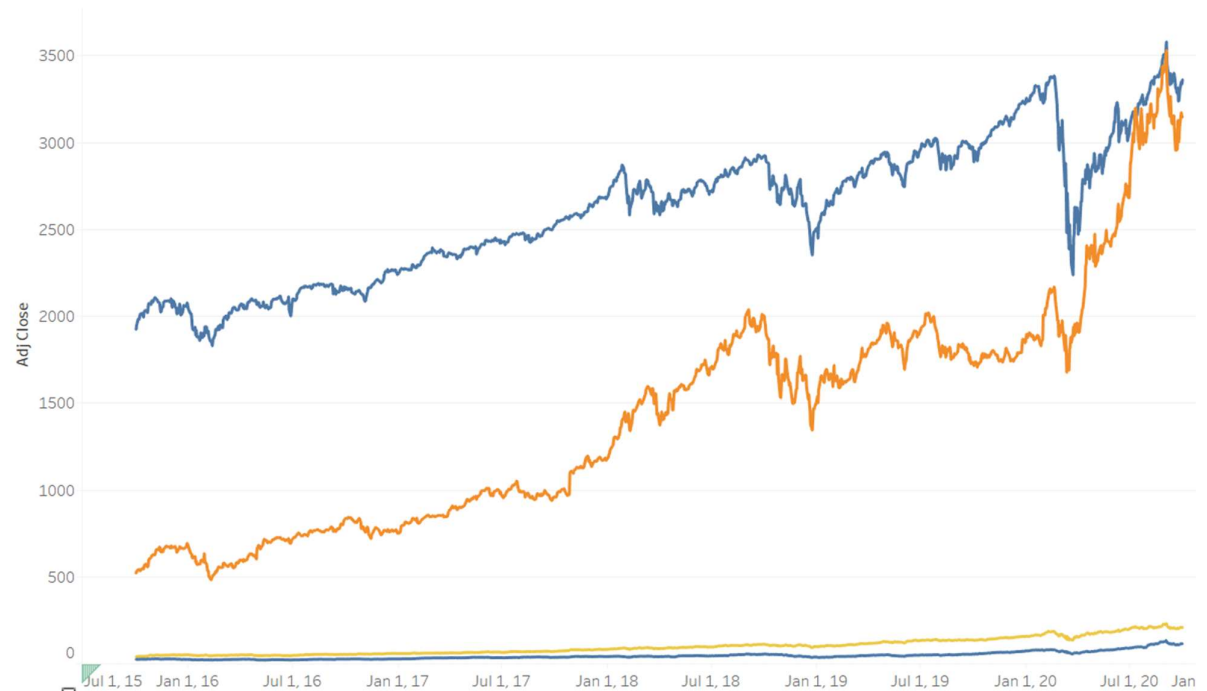
Annualised Risk of each stock:

Amazon: 30.1%

Microsoft: 27.8%

Apple: 29.7%

Portfolio v S&P500



Norm Portfolio v S&P500



Projected Returns of Portfolio & Active Investment Strategy

For Mr Patrick after investing the 500K \$ out of the 1 million in Naturo for minority stake, We are left with 500K \$ which would be invested equally in Amazon & Microsoft.

The investment strategy for Mr Patrick does not require that much level of active monitoring as we are projecting based on the data from last 5 years the capital will be more than doubled after 5 years, with an exception of any unforeseen circumstances in the market.

In case of Mr Peter the whole 1 million \$ is available for investing which will be distributed as 50% in Amazon, 25% in Microsoft & 25% in Apple

As Mr Peter is aiming to maximise the returns on his investment the above portfolio should be actively monitored i.e. Buy Low & Sell High to capitalise any opportunities which may arise in the market, namely in healthcare & pharma sector (Pfizer Inc.) which is giving good returns in recent days

The no. of shares acquired in both cases would vary upon the ongoing buy price of that day

The projected returns for each of the portfolios will be as follows.

Mr. Patrick Jyengar

Company	Investment	Weights	Expected Value	Returns
MSFT	250,000.00	0.50	1,297,009.08	1,047,009.08
AMZN	250,000.00	0.50	1,511,719.42	1,261,719.42
Total	500,000.00		2,808,728.51	2,308,728.51

Projected Value of portfolio	2,808,728.51
Return %	461.7%
Risk %	28.9%
Sharpe Ratio	15.93

Mr. Peter Jyengar

Company	Investment	Weights	Expected Value	Returns
AMZN	500,000.00	0.50	3,023,438.85	2,523,438.85
MSFT	250,000.00	0.25	1,297,009.08	1,047,009.08
AAPL	250,000.00	0.25	1,143,639.48	893,639.48
Total	1,000,000.00		5,464,087.41	4,464,087.41

Projected Value of portfolio	5,464,087.41
Return %	446.4%
Risk %	29.4%
Sharpe Ratio	15.15