

Tech Stock Evaluation

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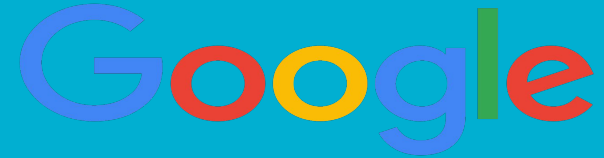
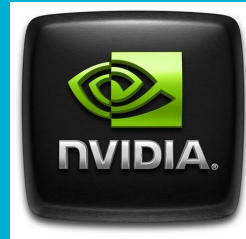
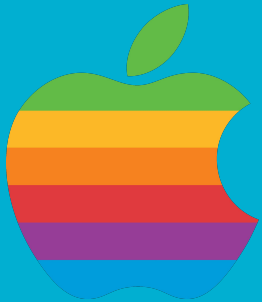
Project Description

Researching Tech company stocks, with a focus on evaluating performance in the last 5 years. Our objective was to compare stock performance and make recommendations based on previous performance.



Focus on Four

- MSFT : Microsoft
- AAPL : Apple
- GOOG : Google
- NVDA : NVidia



Questions

1. Which stock has greatest growth over last 5 years?
2. What is the outlook for these stocks?
3. Which stock has most potential to maximize profits?
4. What recommendations would you make to your client?



Where did we find the data?

- Yahoo Finance API

```
import yfinance as yf
```



Our Process – Part 1

```
# function to reorder columns
def columns(df):
    df = df[['Ticker', 'Open', 'High', 'Low', 'Close', 'Adj Close', 'Volume']]
    return df

# function to calculate difference between high and low price
def highlow(df):
    df = df.assign(Difference = lambda x: x['High'] - x['Low'])
```

```
In [6]: # function to calculate revenue

        def rev(df):

            df = df.assign(Revenue = lambda x: (x['Open'] + x['Close'])/2 * x['Volume'])

            return df
```

```
# function to calculate profit percent change
def pctchg(df):

    df['Revenue Percent Change'] = df['Revenue'].pct_change()

    return df
```

Our Process – Part 2

```
1 # function to add year, month, and day to their own columns by slicing index
2 def date(df):
3     df['Year'] = df.index.year
4     df['Month'] = df.index.month
5     df['Day'] = df.index.day
6
7     return df
8
9 # function for cleaning up and formatting data
10 def cleandat(df):
11     df = df.round(2)
12     df["Revenue Percent Change"] = df["Revenue Percent Change"].map('{:.2f}'.format)
13     df["Revenue"] = df["Revenue"].map("{:.2f}".format)
14     df["Difference"] = df["Difference"].map("{:.2f}".format)
15     df["High"] = df["High"].map("{:.2f}".format)
16     df["Low"] = df["Low"].map("{:.2f}".format)
17     df["Open"] = df["Open"].map("{:.2f}".format)
18     df["Close"] = df["Close"].map("{:.2f}".format)
19     df["Adj Close"] = df["Adj Close"].map("{:.2f}".format)
20     df["Volume"] = df["Volume"].map("{:.0f}".format)
21     return df
22
23 # function to convert dtypes to string and floats for data manipulation
24 def astypes(df):
25     df = df.astype({'Ticker': 'str',
26                     'Open': 'float',
27                     'High': 'float',
28                     'Low': 'float',
29                     'Close': 'float',
30                     'Adj Close': 'float',
31                     'Volume': 'float',
32                     'Revenue': 'float',
33                     'Revenue Percent Change': 'float',
34                     'Difference': 'float'})
35
36     return df
```

Microsoft: MSFT



Multinational technology corporation producing computer software, consumer electronics, personal computers, and related services. Its best-known software products are the Windows line of operating systems, the Microsoft Office suite, and the Internet Explorer and Edge web browsers.

Currently Trading at : \$232

5 years ago : \$62

Growth : 274%

	Ticker	Open	High	Low	Close	Adj Close
Date						
2017-01-03	MSFT	62.79	62.84	62.13	62.58	57.81
2017-01-04	MSFT	62.48	62.75	62.12	62.30	57.55
2017-01-05	MSFT	62.19	62.66	62.03	62.30	57.55
2017-01-06	MSFT	62.30	63.15	62.04	62.84	58.05
2017-01-09	MSFT	62.76	63.08	62.54	62.64	57.86

	Ticker	Open	High	Low	Close	Adj Close
Date						
2022-04-25	MSFT	273.29	281.11	270.77	280.72	279.47
2022-04-26	MSFT	277.50	278.36	270.00	270.22	269.02
2022-04-27	MSFT	282.10	290.97	279.16	283.22	281.96
2022-04-28	MSFT	285.19	290.98	281.46	289.63	288.34
2022-04-29	MSFT	288.61	289.88	276.50	277.52	276.29

Apple: AAPL

Multinational technology company specializing in consumer electronics, software and online services. Apple is the largest technology company by revenue (totaling US\$365.8 billion in 2021) and, as of June 2022, is the world's biggest company by market capitalization, the fourth-largest personal computer vendor by unit sales and second-largest mobile phone manufacturer.

Currently Trading At : \$153

5 Years Ago : \$28

Growth : 446%

Date	Ticker	Open	High	Low	Close	Adj Close
2017-01-03	AAPL	28.95	29.08	28.69	29.04	27.22
2017-01-04	AAPL	28.96	29.13	28.94	29.00	27.19
2017-01-05	AAPL	28.98	29.22	28.95	29.15	27.33
2017-01-06	AAPL	29.19	29.54	29.12	29.48	27.63
2017-01-09	AAPL	29.49	29.86	29.49	29.75	27.89

Date	Ticker	Open	High	Low	Close	Adj Close
2022-04-25	AAPL	161.12	163.17	158.46	162.88	162.42
2022-04-26	AAPL	162.25	162.34	156.72	156.80	156.35
2022-04-27	AAPL	155.91	159.79	155.38	156.57	156.12
2022-04-28	AAPL	159.25	164.52	158.93	163.64	163.17
2022-04-29	AAPL	161.84	166.20	157.25	157.65	157.20

Google: GOOG



Focused on search engine technology, online advertising, cloud computing, computer software, quantum computing, e-commerce, artificial intelligence, and consumer electronics.

Currently : \$120

5 Years Ago : \$39

Growth: 207%

	Ticker	Open	High	Low	Close	Adj Close
Date						
2017-01-03	GOOG	38.94	39.48	38.79	39.31	39.31
2017-01-04	GOOG	39.42	39.57	39.16	39.35	39.35
2017-01-05	GOOG	39.30	39.72	39.25	39.70	39.70
2017-01-06	GOOG	39.76	40.40	39.61	40.31	40.31
2017-01-09	GOOG	40.32	40.50	40.14	40.33	40.33

	Ticker	Open	High	Low	Close	Adj Close
Date						
2022-04-25	GOOG	119.43	123.28	118.77	123.25	123.25
2022-04-26	GOOG	122.75	122.75	119.16	119.51	119.51
2022-04-27	GOOG	114.37	117.50	113.12	115.02	115.02
2022-04-28	GOOG	117.11	120.44	115.14	119.41	119.41
2022-04-29	GOOG	117.58	118.96	114.69	114.97	114.97

NVidia: NVDA



It is a software and fabless company which designs graphics processing units (GPUs), application programming interface (APIs) for data science and high-performance computing as well as system on a chip units (SoCs) for the mobile computing and automotive market. Nvidia is a global leader in artificial intelligence hardware and software.

Currently: \$134

5 Years Ago : \$25

Growth : 436%

	Ticker	Open	High	Low	Close	Adj Close
Date						
2017-01-03	NVDA	26.10	26.59	24.84	25.50	25.15
2017-01-04	NVDA	25.85	26.38	25.38	26.10	25.74
2017-01-05	NVDA	26.13	26.45	25.26	25.43	25.09
2017-01-06	NVDA	25.71	26.06	25.30	25.77	25.42
2017-01-09	NVDA	25.88	27.00	25.88	26.82	26.45

	Ticker	Open	High	Low	Close	Adj Close
Date						
2022-04-25	NVDA	192.02	199.45	190.96	199.02	198.92
2022-04-26	NVDA	197.18	197.88	186.70	187.88	187.78
2022-04-27	NVDA	185.98	191.67	182.90	184.15	184.06
2022-04-28	NVDA	189.67	200.37	184.90	197.82	197.72
2022-04-29	NVDA	194.02	201.28	185.17	185.47	185.38

Question 1: Which stock has the greatest growth over the last 5 years?

- Based on our analysis from above, Apple experienced the largest growth over the last 5 years with a 446% growth rate.
- Nvidia was a close second with a growth rate of 436% over the last 5 years.



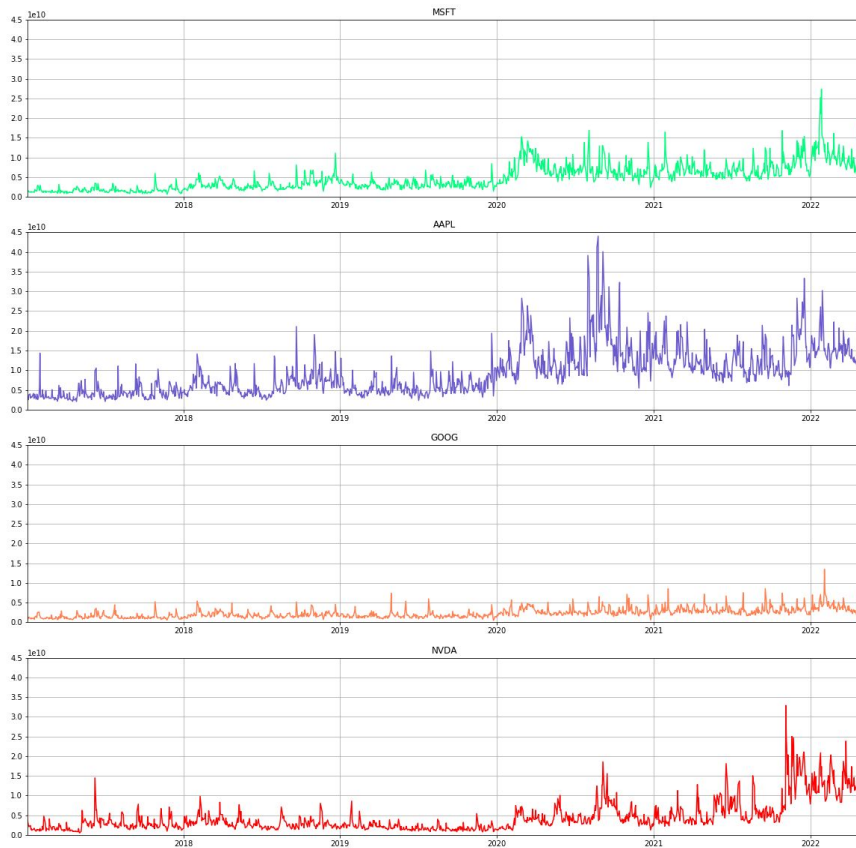
Adj Close Over Time

- Adjusted closing price provides a more accurate snapshot of a stock's value than the closing price because it accounts for factors such as dividend payouts, stock splits, and issuance of new shares.

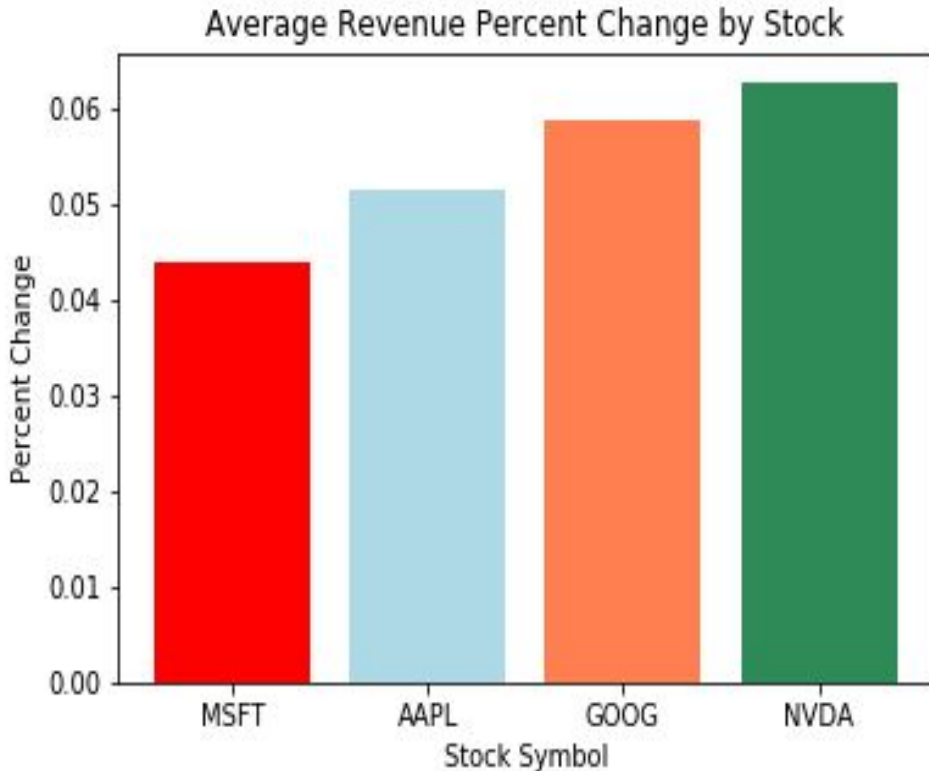


Revenue Over Time

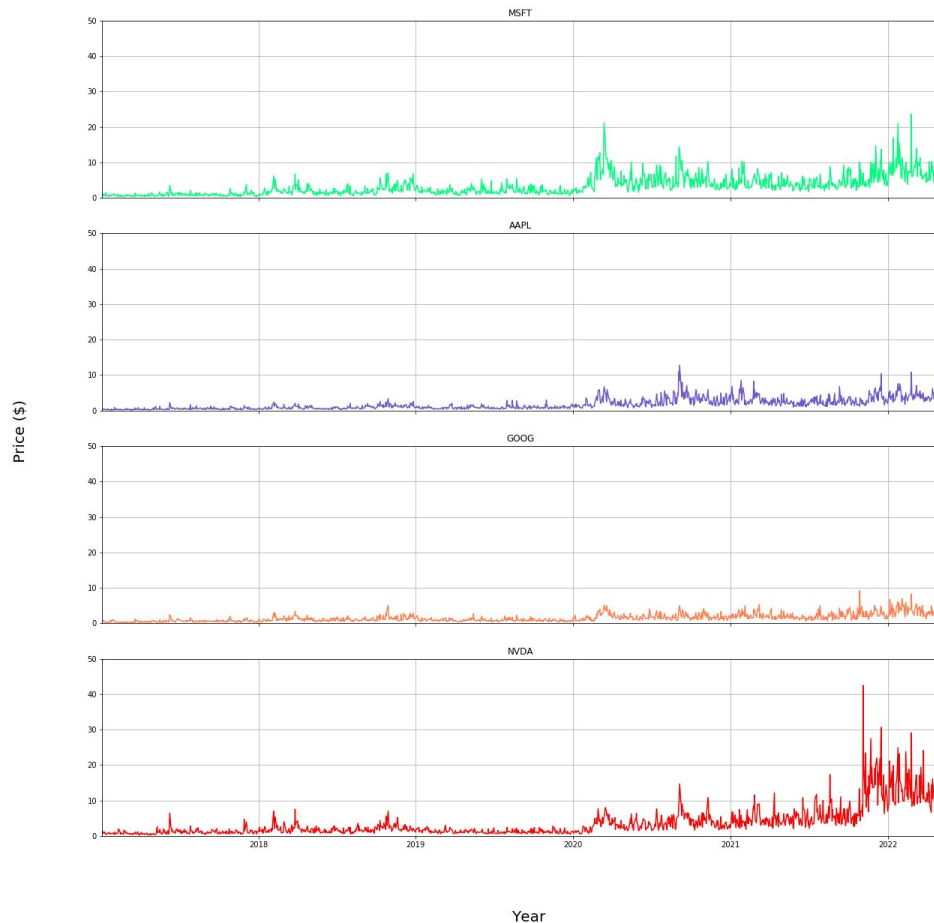
- This visual shows the gross revenue of each stock over the last 5 years in billions.



Average Revenue Percent Change



- This is average change in profit for each stock over the last 5 years
- A negative value would indicate the stock is underperforming the years before.



Price Spread

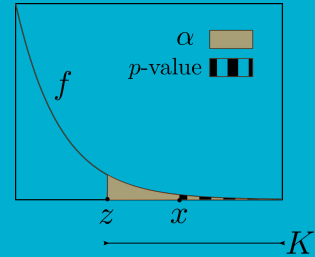
- This is the price spread of each stock (High price minus Low price) over the 5 year period.

Question 2: What is the outlook for these stocks?



- Up until Q4 of 2021, all four stocks experienced a positive overall trend upwards
- In Q1 of 2022, all four have started to trend downward, with NVIDIA experiencing the largest shift
- Apple and Google seem to be the least affected by the negative trend, which makes sense since their Price Spread visuals show they also have the least volatility

Question 3: Which stock has the most potential to maximize profits?



HYPOTHESIS: AAPL stock is the most profitable over the last 5 years and thus, has the most potential to maximize profits.

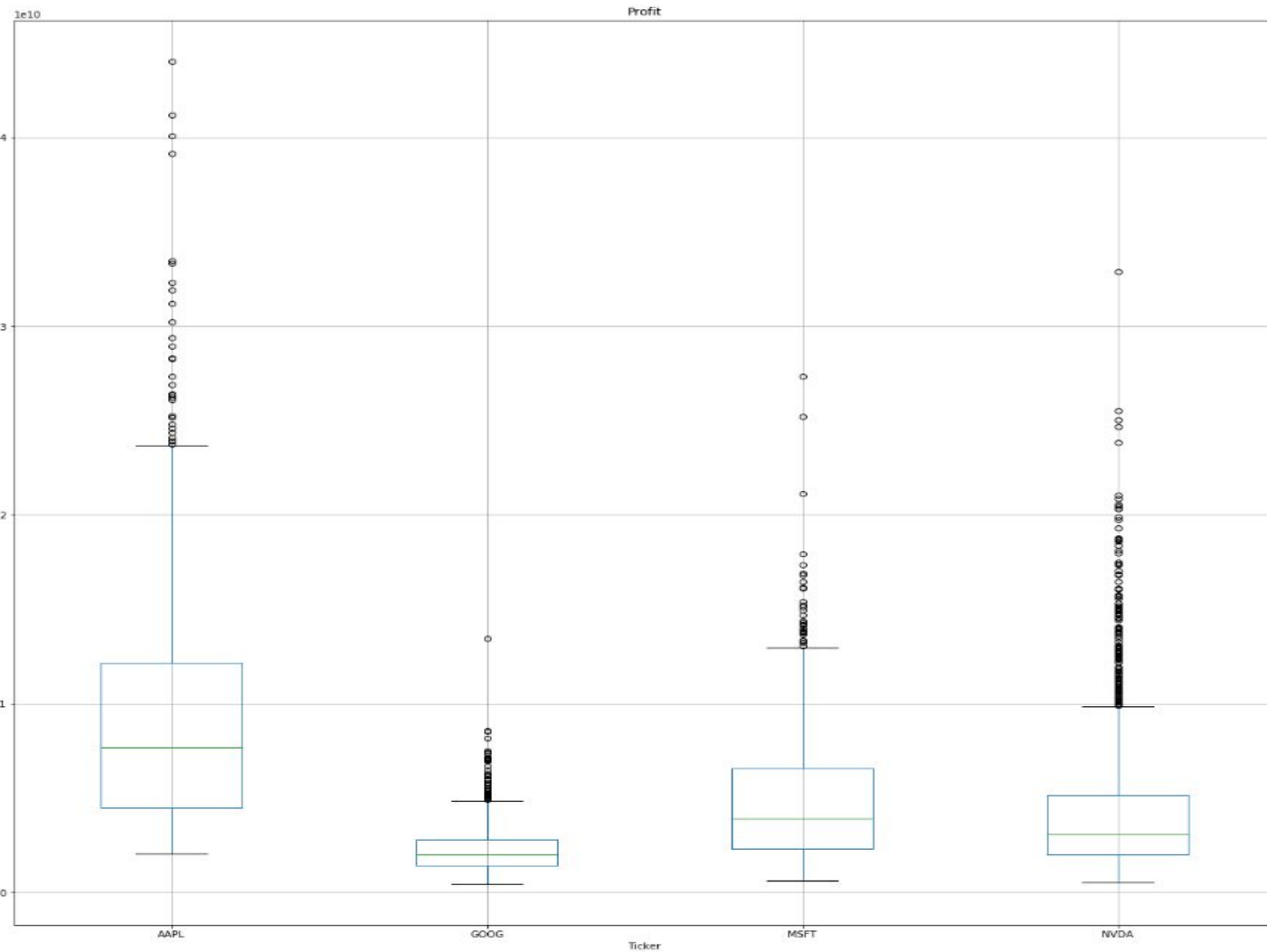
NULL HYPOTHESIS: AAPL stock is not the most profitable, and some other stock has the most potential to maximize profits.

- Based on our ANOVA test, our pvalue is less than our significance level of 0.05, so we reject the null hypothesis and find that AAPL stock was the most profitable over the last 5 years and has the most potential to maximize growth.

```
Ticker
AAPL    9.131305e+09
GOOG    2.282990e+09
MSFT    4.829010e+09
NVDA    4.452933e+09
Name: Profit, dtype: float64
F_onewayResult(statistic=715.9653859070331, pvalue=0.0)
Pvalue is less than our 0.05 level of significance, so we reject the Null Hypothesis and reccomend investing in AAPL.
```

Stock with the most Potential

- Shows Apple outperformed all other tech stocks over the 5 year period



Question 4: What recommendations would you make to your client?

- Invest in AAPL due to their upward trend in revenue in the last few quarters, as well as the stock's resilience
- Based on our Revenue Percent Change bar chart, in addition to AAPL, we would recommend investing in NVDA since they have the highest average percent revenue change with a positive 6.28 percent over the last 5 years.



Conclusions



- The highest performing stock over the last 5 years was Apple, followed by Microsoft
- Stock with the most growth in the last 5 years was Apple
- Since Microsoft experienced the largest increase in stock price, we expected it to be the top performer, but because of the lack of volume, Apple outperformed it
- Apple was by far the smartest investment for our client, however, if they were to ask for a more growth oriented stock we would steer them towards Nvidia or Microsoft

Citations

[https://www.investopedia.com/terms/h/high_minus_low.asp#:~:text=High%20Minus%20Low%20\(HML\)%20is%20a%20value%20premium%3B%20it,be%20found%20by%20linear%20regression](https://www.investopedia.com/terms/h/high_minus_low.asp#:~:text=High%20Minus%20Low%20(HML)%20is%20a%20value%20premium%3B%20it,be%20found%20by%20linear%20regression)