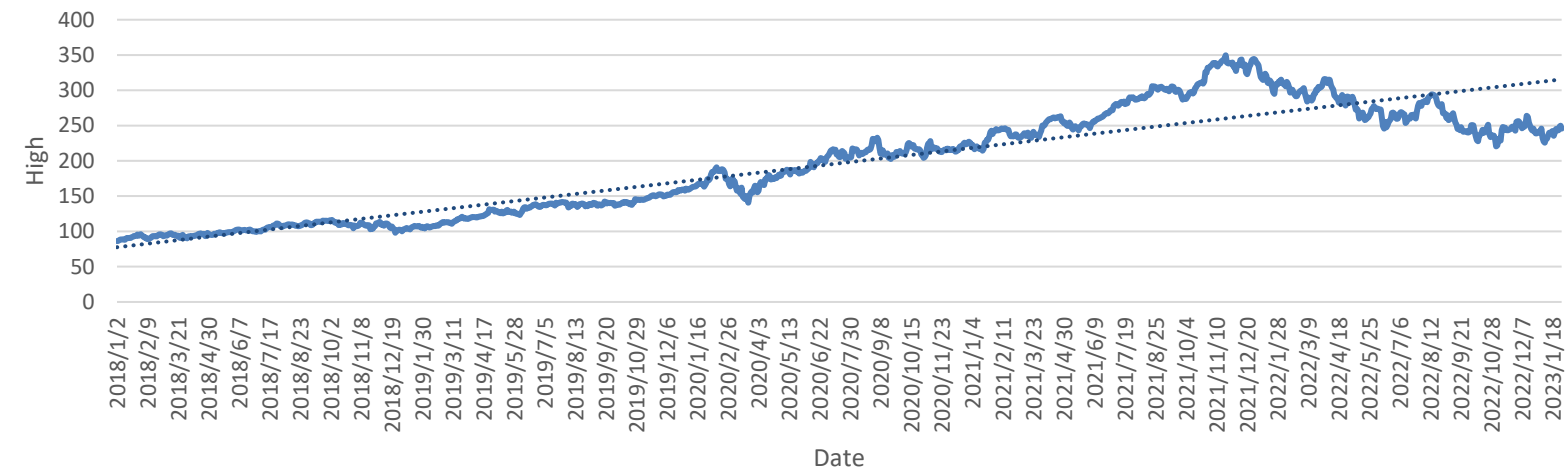Oeson Project1

Stock Analysis of Microsoft, Tesla and Apple
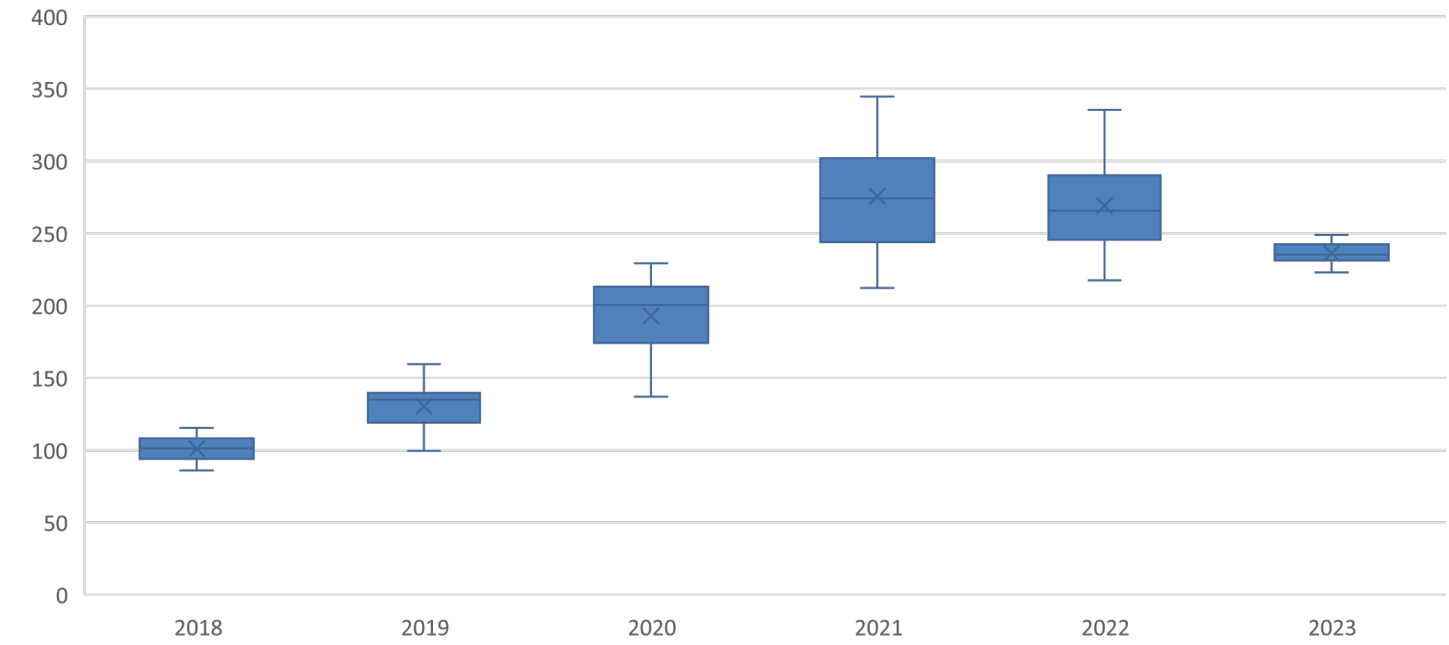
Zhuoqun(Aiden) Yang

Microsoft

Line Plot of MSFT Opening Stock Prices From 2018-2023
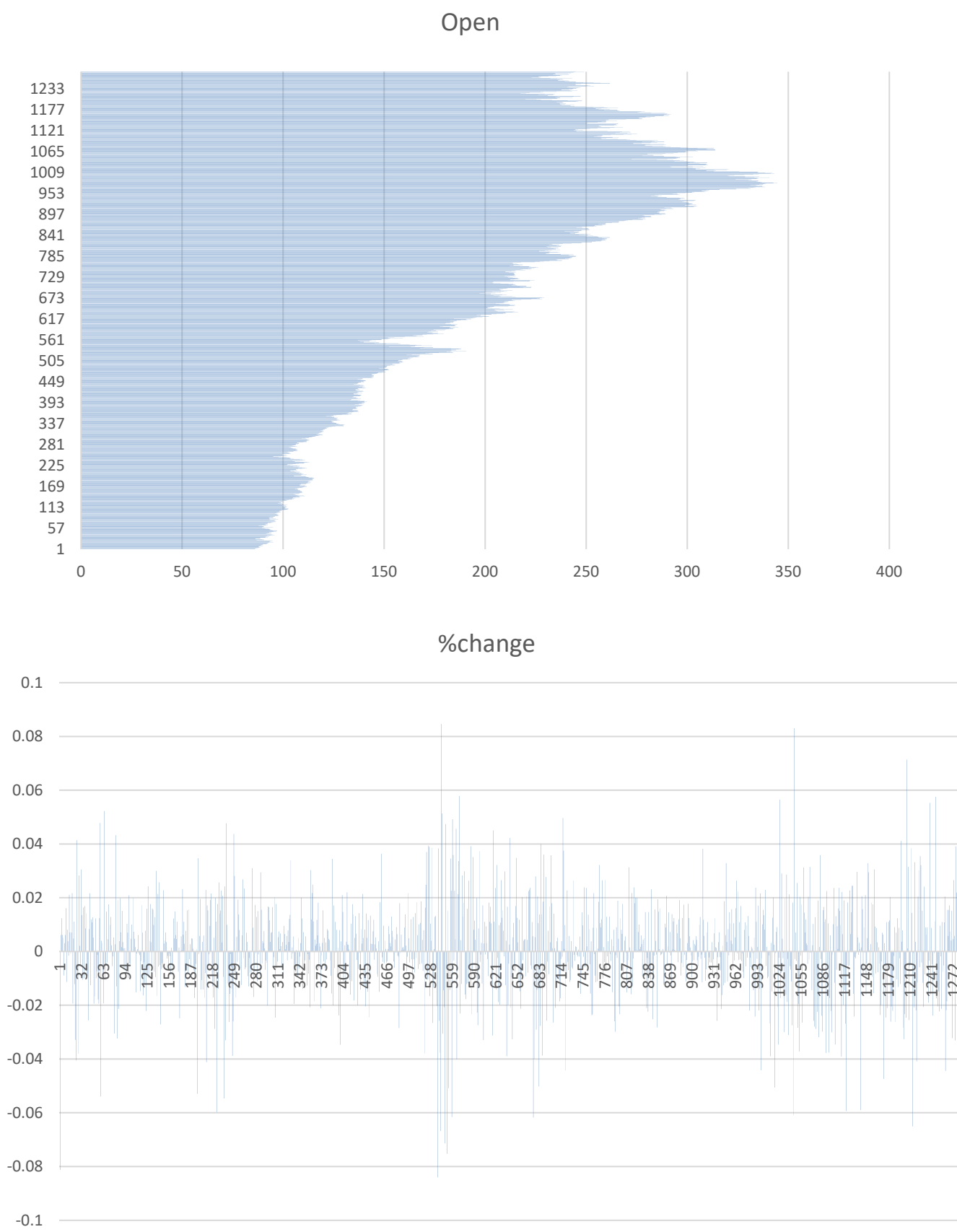
Box Chart of MSFT Stock Prices From 2018-2023

	Open			%change	
Mean	194.4709		Mean		0.000917
Standard Error	2.076481		Standard Error		0.000508
Median	203.58		Median		0.001227
Mode	95.14		Mode		#N/A
Standard Deviation	74.2324		Standard Deviation		0.018163
Sample Variance	5510.449		Sample Variance		0.00033
Kurtosis	-1.28796		Kurtosis		2.532941
Skewness	0.149832		Skewness		-0.27075
Range	258.56		Range		0.168715
Minimum	86.06		Minimum		-0.08407
Maximum	344.62		Maximum		0.08464
Sum	248533.8		Sum		1.170947
Count	1278		Count		1277

Microsoft shows a general increase in stock prices from 2018 to 2022, with a decline from 2022 to 2023. It's noted for its high volatility, with a mean stock value of 194.471 and a high standard deviation of 74.23.
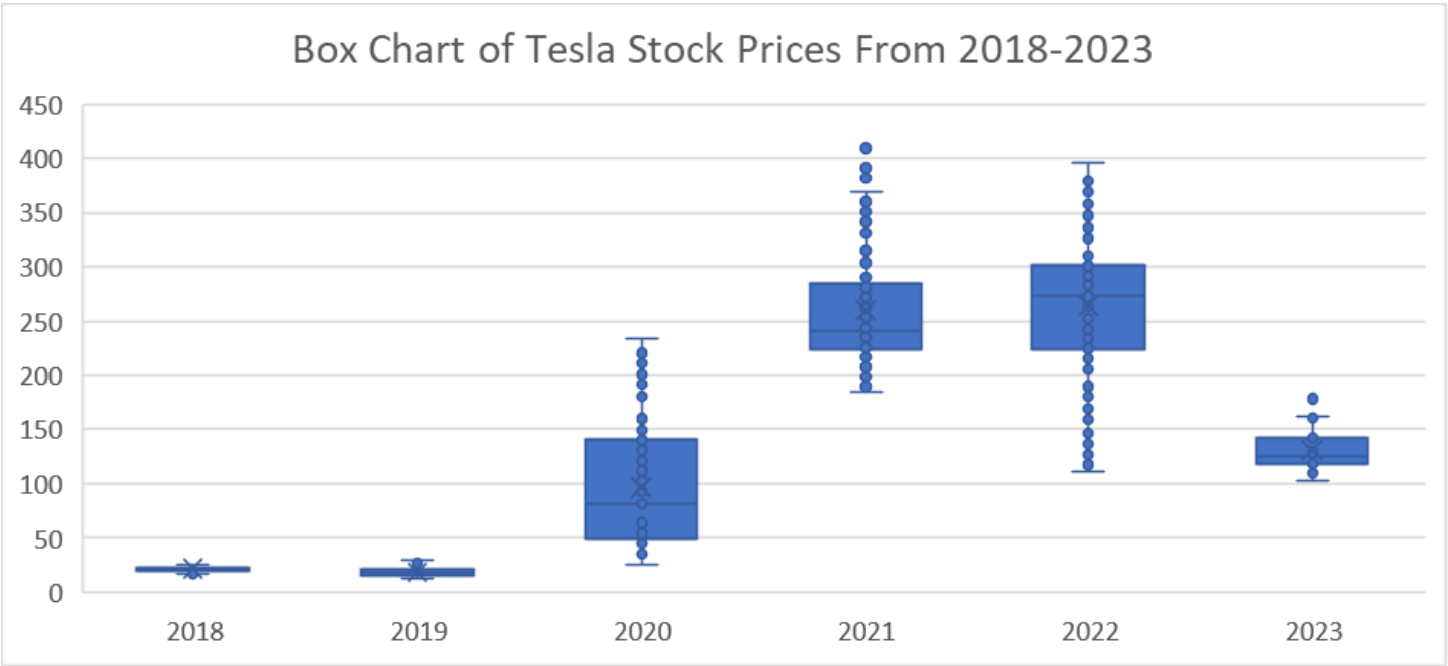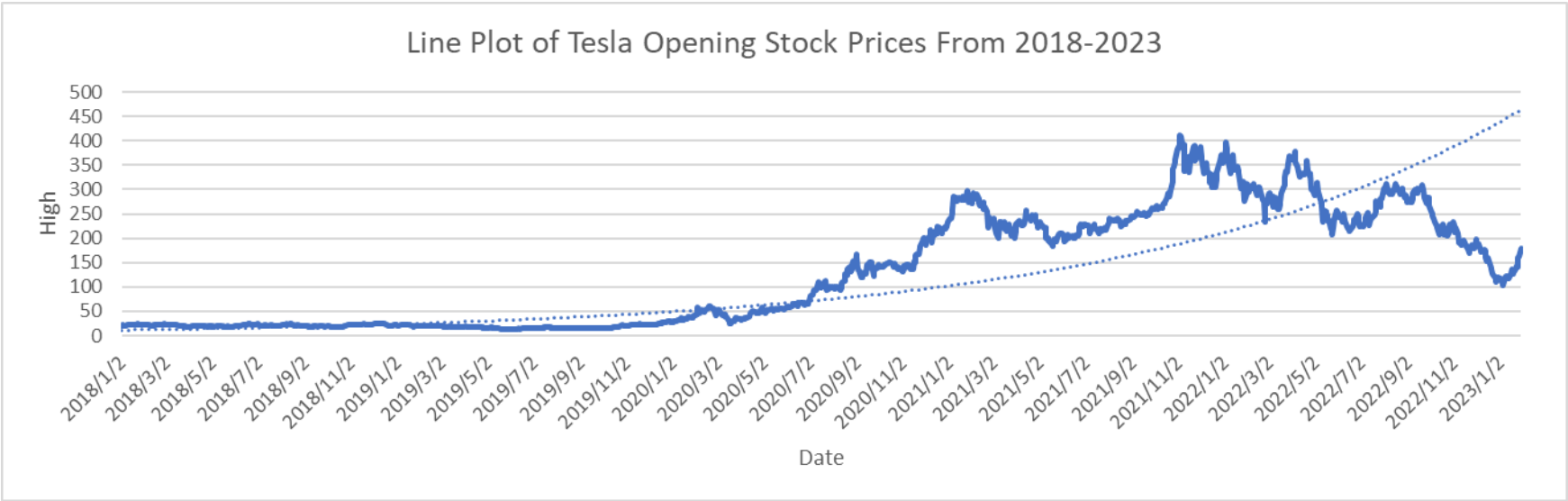
Microsoft

Open

%change

	pen		%change	
Mean	194.4709	Mean	0.000917	
Standard Error	2.076481	Standard Error	0.000508	
Median	203.58	Median	0.001227	
Mode	95.14	Mode	#N/A	
Standard Deviation	74.2324	Standard Deviation	0.018163	
Sample Variance	5510.449	Sample Variance	0.00033	
Kurtosis	-1.28796	Kurtosis	2.532941	
Skewness	0.149832	Skewness	-0.27075	
Range	258.56	Range	0.168715	
Minimum	86.06	Minimum	-0.08407	
Maximum	344.62	Maximum	0.08464	
Sum	248533.8	Sum	1.170947	
Count	1278	Count	1277	

•**Skewness**: Slightly positive (0.149), indicating a slight bias towards higher values.
•**Kurtosis**: Platykurtic, suggesting fewer extreme outliers than a normal distribution.
The distribution of Microsoft stock values indicates high volatility with a general increase in stock prices from 2018 to 2022, followed by a decline from 2022 to 2023. The slightly positive skewness suggests that there are marginally more days with stock prices ending higher than the average, but the platykurtic kurtosis indicates fewer extreme price movements.
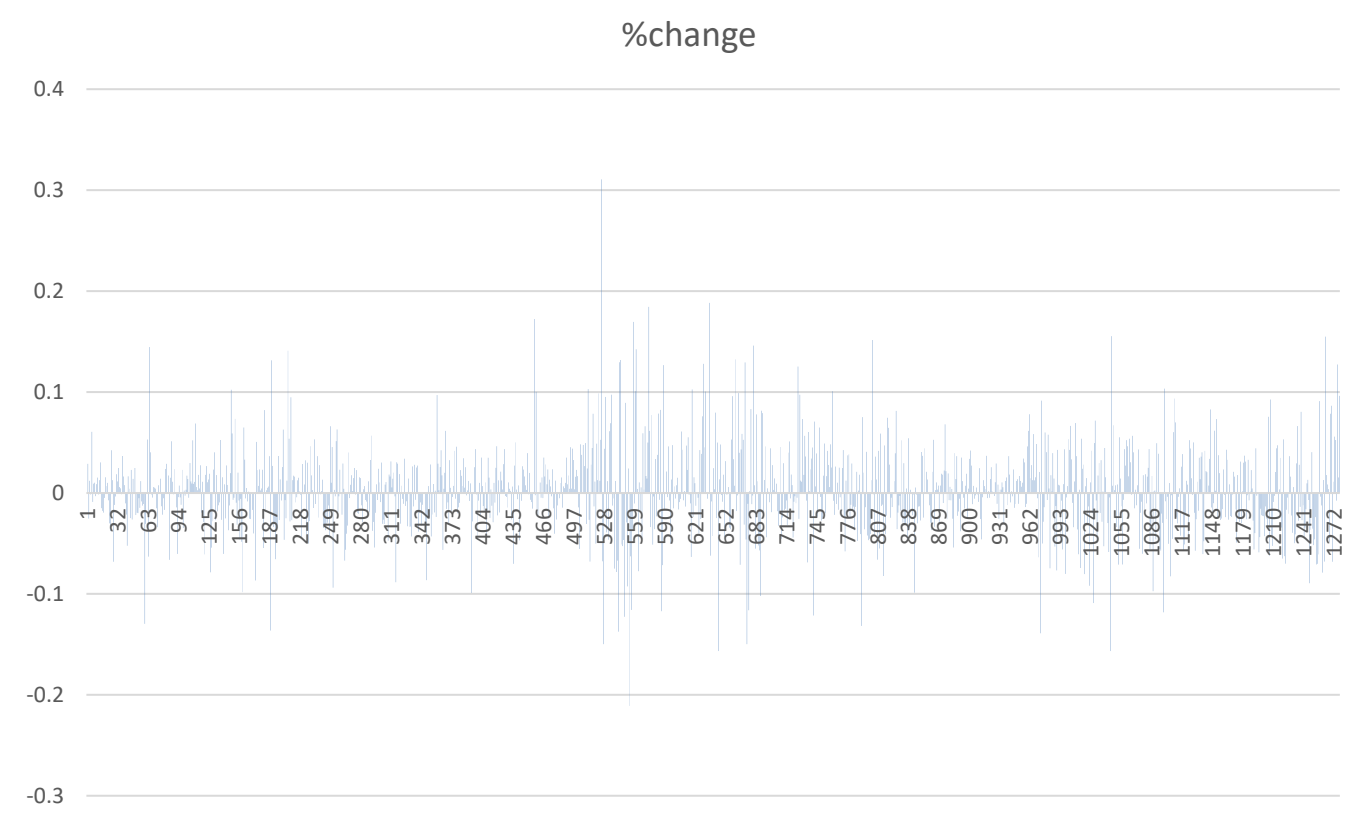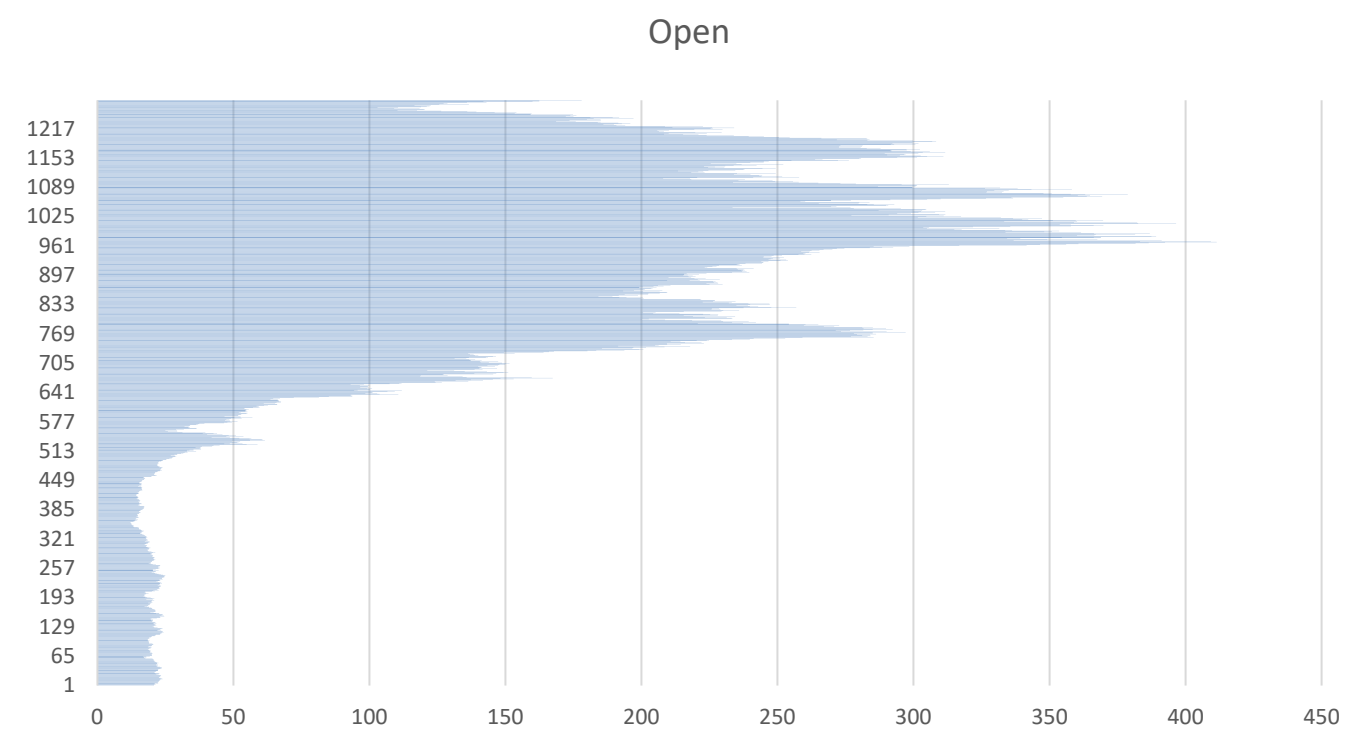
Tesla

Line Plot of Tesla Opening Stock Prices From 2018-2023

Box Chart of Tesla Stock Prices From 2018-2023

Open			%change	
Mean	131.8952	Mean		0.002625
Standard Error	3.277467	Standard Error		0.001221
Median	96.57333	Median		0.001982
Mode	24	Mode		0
Standard Deviation	117.1666	Standard Deviation		0.043617
Sample Variance	13728.01	Sample Variance		0.001902
Kurtosis	-1.25726	Kurtosis		4.115033
Skewness	0.470592	Skewness		0.413471
Range	399.3967	Range		0.521557
Minimum	12.07333	Minimum		-0.21092
Maximum	411.47	Maximum		0.310632
Sum	168562.1	Sum		3.352144
Count	1278	Count		1277

Tesla begins with low stock prices until 2019, then experiences sharp increases and decreases in stock prices, indicating large variability and volatility. Its mean stock value from 2018 to 2023 is 131.9 with a standard deviation of 117.167.

Tesla

Open

%change

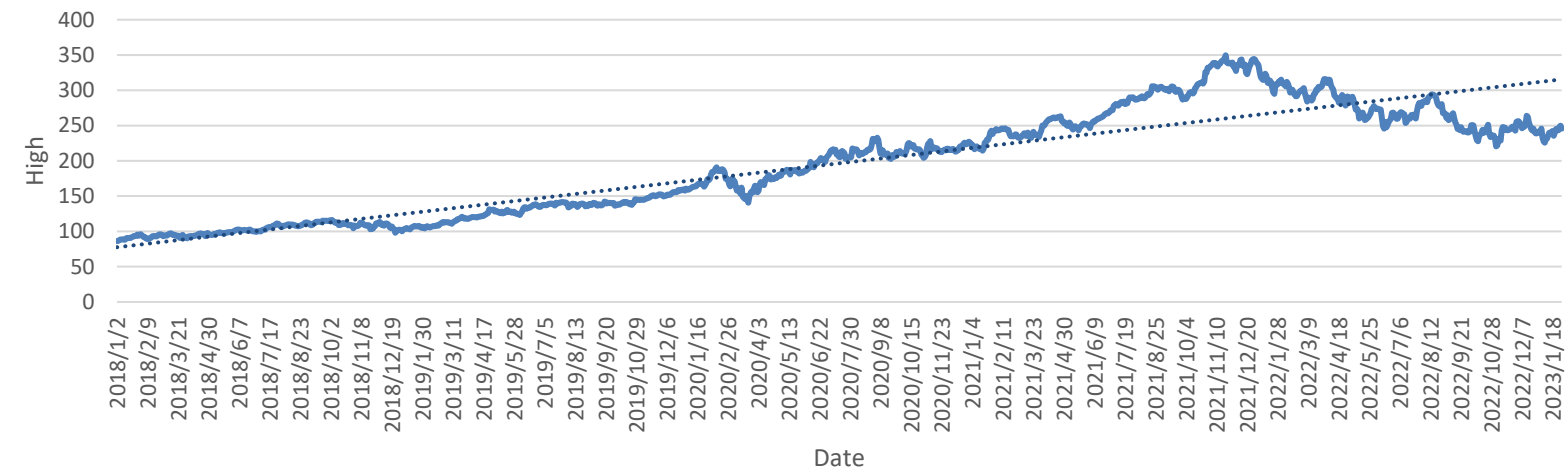| Open			%change	
Mean	131.8952		Mean	0.002625
Standard Error	3.277467		Standard Error	0.001221
Median	96.57333		Median	0.001982
Mode	24		Mode	0
Standard Deviation	117.1666		Standard Deviation	0.043617
Sample Variance	13728.01		Sample Variance	0.001902
Kurtosis	-1.25726		Kurtosis	4.115033
Skewness	0.470592		Skewness	0.413471
Range	399.3967		Range	0.521557
Minimum	12.07333		Minimum	-0.21092
Maximum	411.47		Maximum	0.310632
Sum	168562.1		Sum	3.352144
Count	1278		Count	1277

Skewness: Slightly positive (0.47), suggesting a higher presence of positive outliers over negative outliers.
Kurtosis: Platykurtic (-1.25726), indicating a flatter curve and thinner tails, showing a lower presence of extreme outliers.
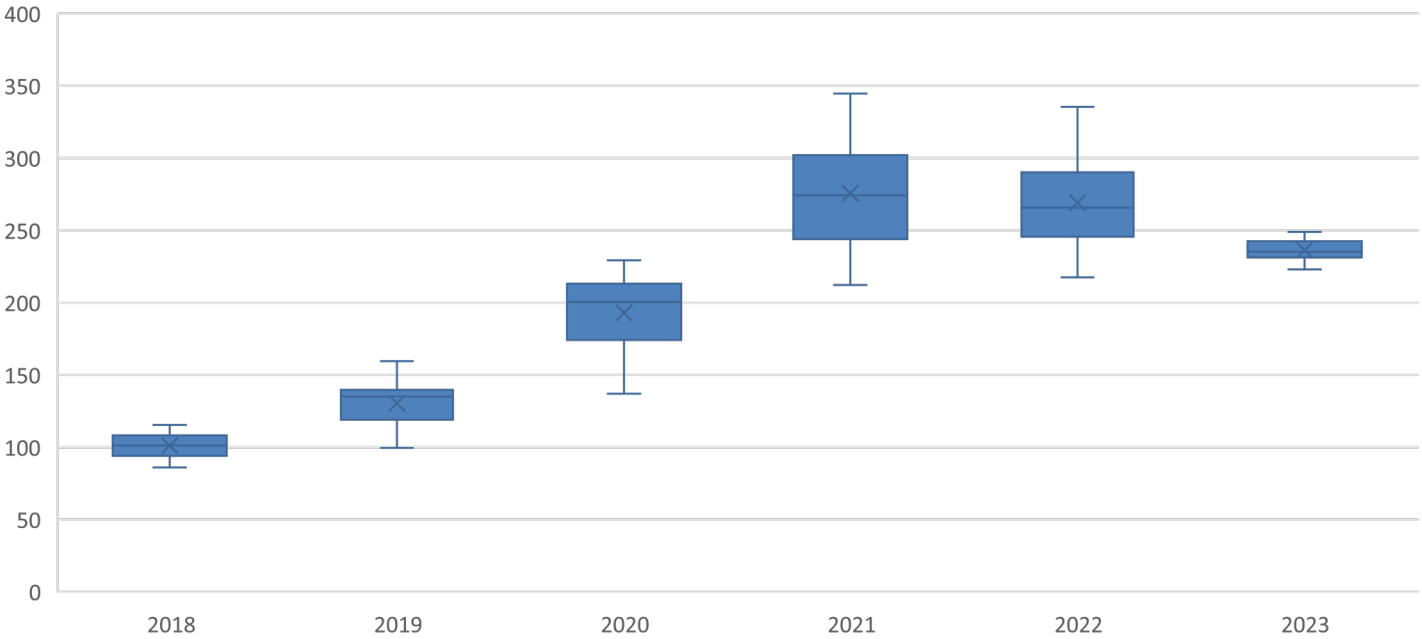Tesla's stock value distribution reflects large variability and volatility, with sharp increases from 2019 to early 2020 and again in early 2021, followed by a decline from 2022 to 2023. The positive skewness and platykurtic kurtosis suggest that while the stock has seen days with significantly higher prices, extreme price movements are less common than in a normal distribution.

Apple

Line Plot of MSFT Opening Stock Prices From 2018-2023

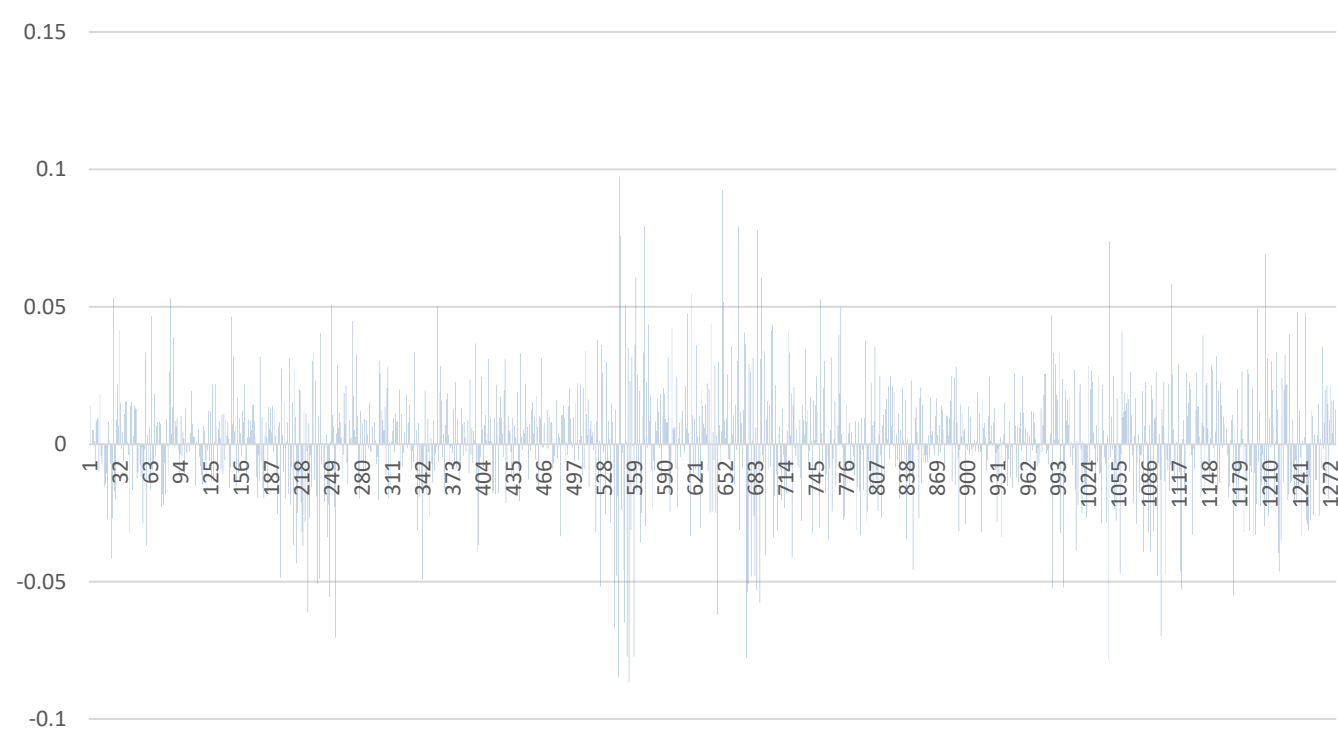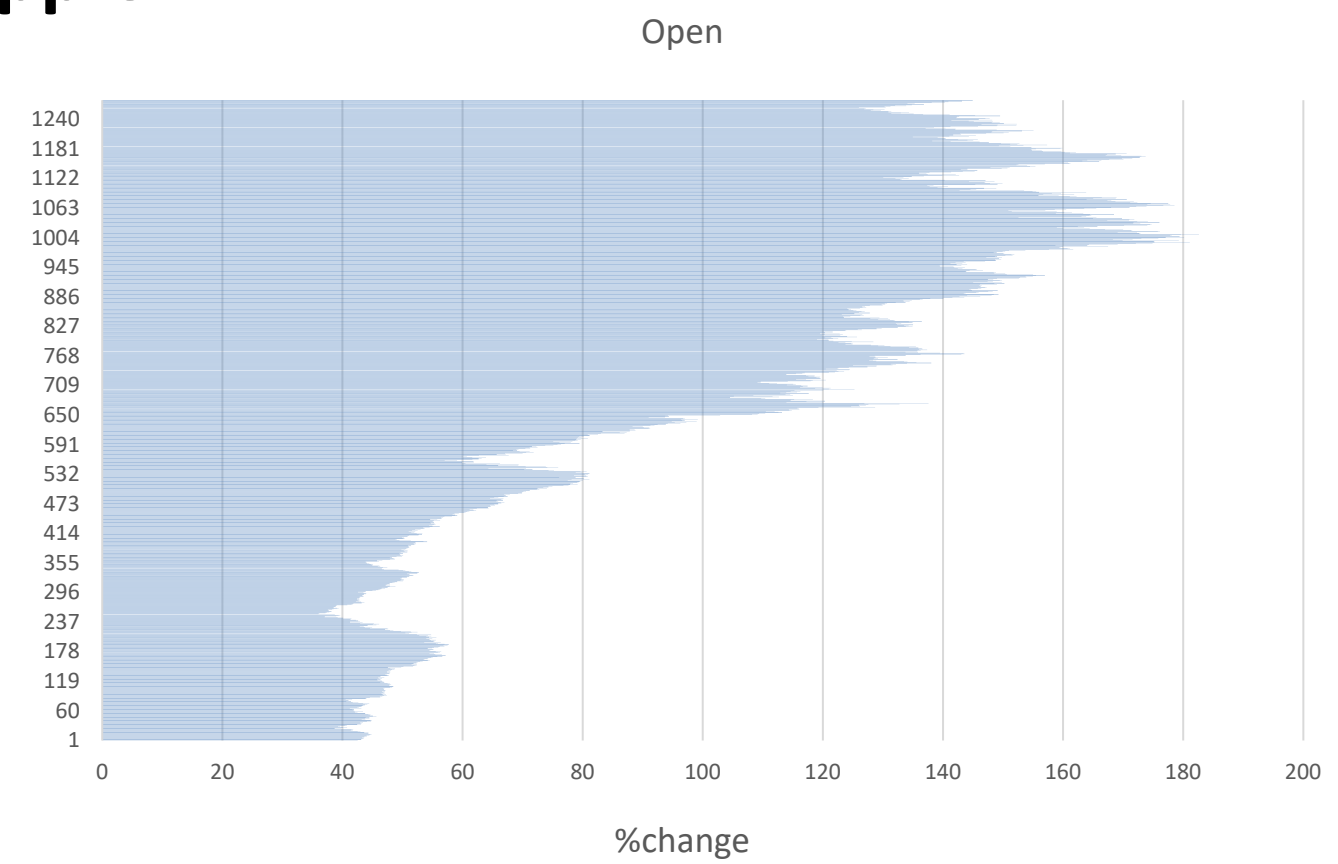### Box Chart of MSFT Stock Prices From 2018-2023

	Open			%change	
Mean	98.5741		Mean		0.001175
Standard Error	1.291672		Standard Error		0.000579
Median	95.0875		Median		0.001993
Mode	127.82		Mode		#N/A
Standard Deviation	46.17614		Standard Deviation		0.020698
Sample Variance	2132.236		Sample Variance		0.000428
Kurtosis	-1.58204		Kurtosis		2.48063
Skewness	0.121834		Skewness		-0.15127
Range	146.635		Range		0.183858
Minimum	35.995		Minimum		-0.0866
Maximum	182.63		Maximum		0.097256
Sum	125977.7		Sum		1.500474
Count	1278		Count		1277

Skewness: Slightly positive (0.12), indicating a slightly higher presence of positive outliers compared to negative outliers.
Kurtosis: -1.58, suggesting the presence of fewer outliers.
Apple's stock value shows a general upward rise from 2018 to early 2022, with a subsequent decline. The distribution characteristics indicate moderate volatility with a slight bias toward positive changes. The negative kurtosis value suggests fewer extreme outliers, aligning with the more stable growth pattern described.

Apple

Open

%change

Open			%change	
Mean	98.5741		Mean	0.001175
Standard Error	1.291672		Standard Error	0.000579
Median	95.0875		Median	0.001993
Mode	127.82		Mode	#N/A
Standard Deviation	46.17614		Standard Deviation	0.020698
Sample Variance	2132.236		Sample Variance	0.000428
Kurtosis	-1.58204		Kurtosis	2.48063
Skewness	0.121834		Skewness	-0.15127
Range	146.635		Range	0.183858
Minimum	35.995		Minimum	-0.0866
Maximum	182.63		Maximum	0.097256
Sum	125977.7		Sum	1.500474
Count	1278		Count	1277

Apple shows a general upward trend from 2018 to early 2022, followed by a decline. It has a mean stock value of 98.57 and a moderate level of volatility, indicated by a standard deviation of 46.18.
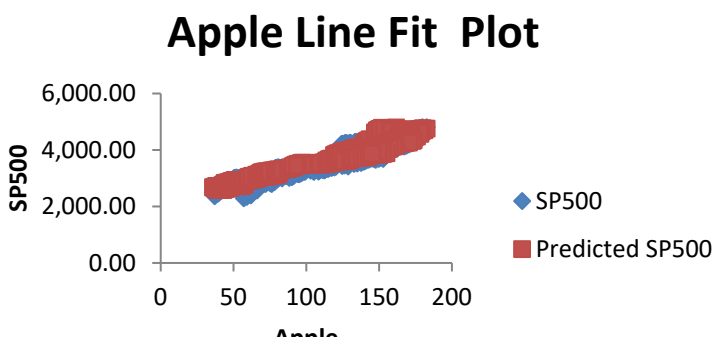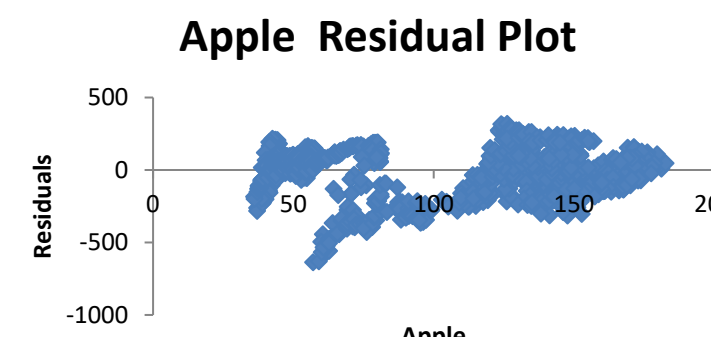
Comparative Analysis

Line Plot of Opening Stock Prices From 2018-2023
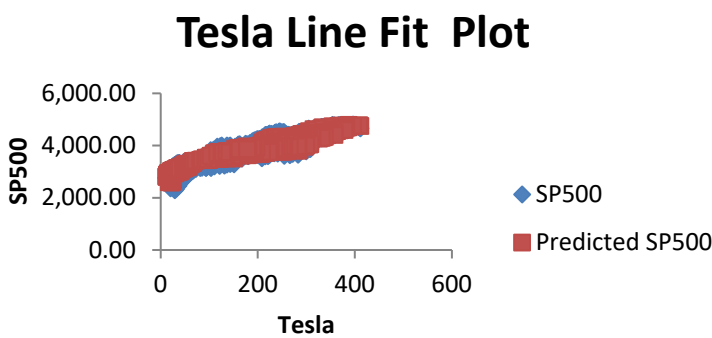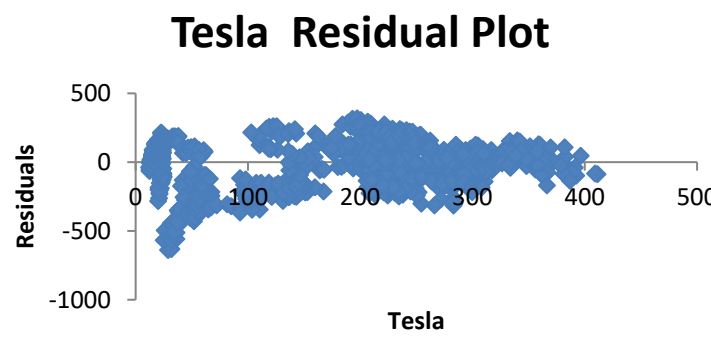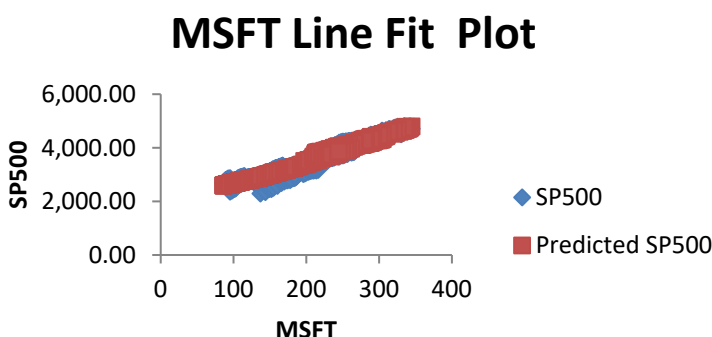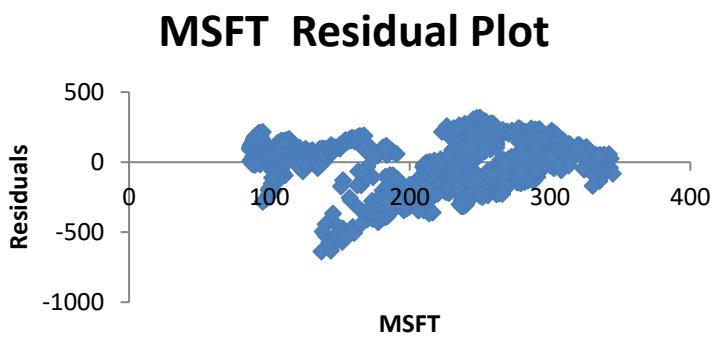
Open
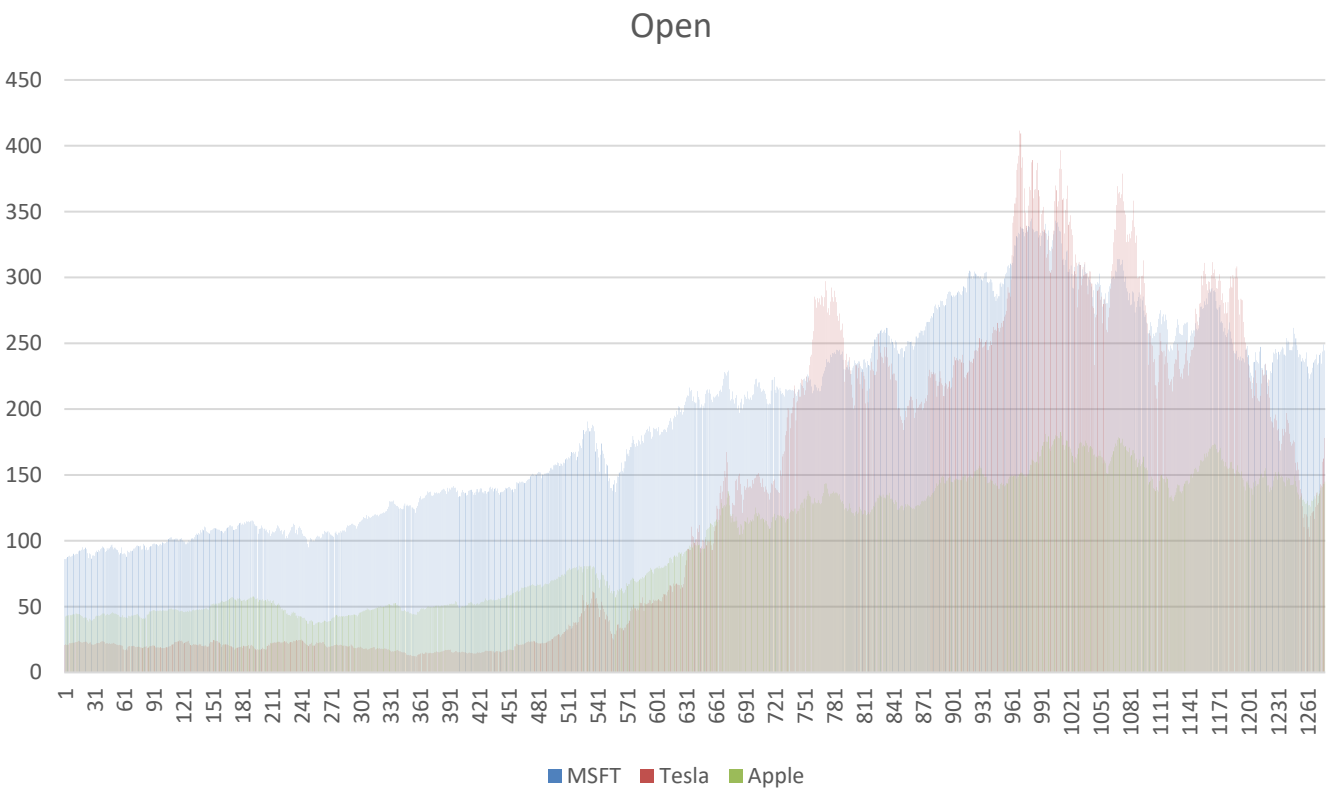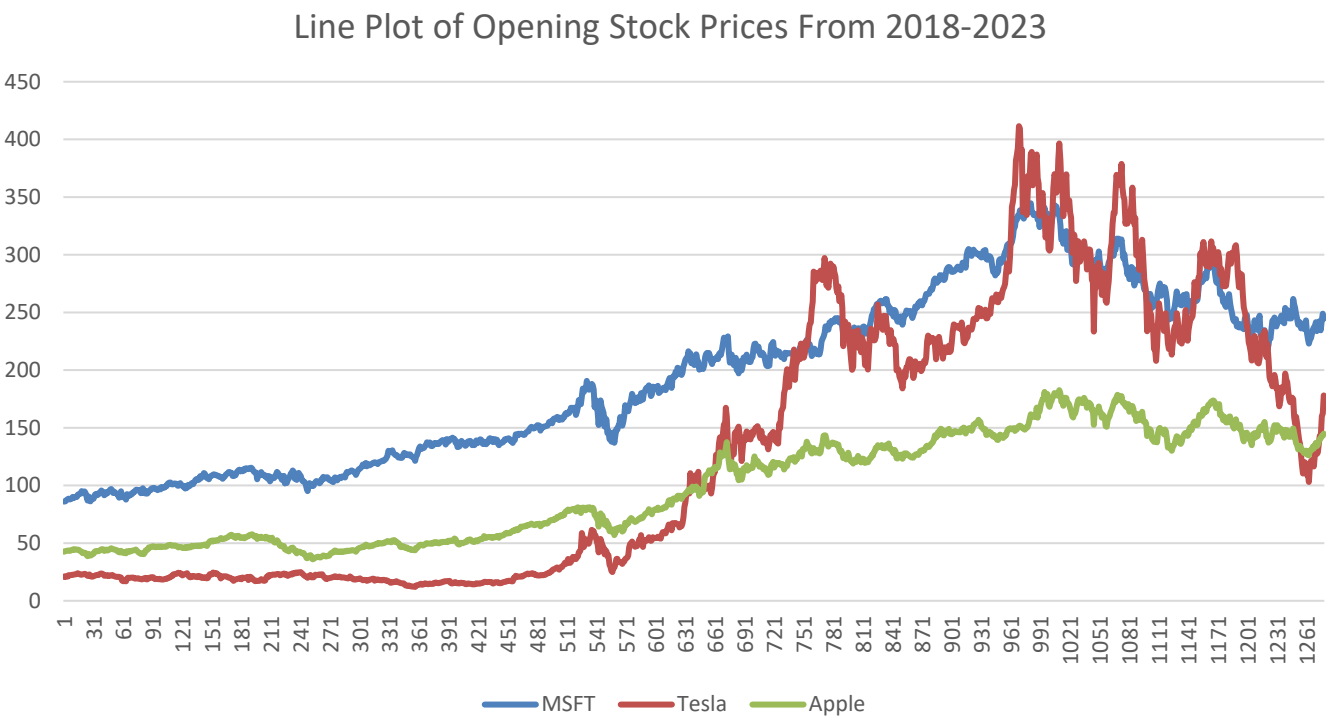
Comparative Analysis

Microsoft is noted for stable increases with slight volatility during product releases, new acquisitions, and profitable partnerships, making it suitable for investors seeking reliability and long-term gradual returns.

Tesla experiences generally unstable growth with sharp increases and declines, suitable for investors looking for high risk and high reward, despite being the most volatile.

Apple demonstrates stable growth with slight peaks following new product releases, ideal for investors desiring low risk, consistent financial performance, and regular dividends.

Correlation Analysis

MSFT Residual Plot

MSFT Line Fit Plot

Tesla Residual Plot

Tesla Line Fit Plot

Apple Residual Plot

Apple Line Fit Plot

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.972028
R Square	0.944839
Adjusted R	0.944709
Standard E	156.7349
Observatic	1278

ANOVA

	df	SS	MS	F	ignificance F
Regression	3	5.36E+08	1.79E+08	7274.003	0
Residual	1274	31296848	24565.81		
Total	1277	5.67E+08			

	Coefficients	andard Err	t Stat	P-value	Lower 95%	Upper 95%	ower 95.0%	pper 95.0%
Intercept	2006.627	21.48825	93.38253	0	1964.471	2048.784	1964.471	2048.784
MSFT	6.189073	0.253739	24.3915	3.8E-108	5.691281	6.686865	5.691281	6.686865
Tesla	1.456464	0.131389	11.0851	2.51E-27	1.198701	1.714227	1.198701	1.714227
Apple	0.555029	0.474041	1.170845	0.24188	-0.37496	1.485016	-0.37496	1.485016

Correlation to S&P 500

Microsoft shows a relatively strong positive correlation with the S&P 500, with a slope of 0.495 and a high R^2 value of 0.6, suggesting that changes in Microsoft's stock price are closely aligned with industry trends.

Tesla has a weaker positive correlation with the S&P 500, with a slope of 0.127 and an R^2 value of 0.23, indicating that Tesla's stock prices may be more influenced by organizational factors than industry trends.

Apple has a positive relationship with the S&P 500, with a slope of 0.41 and an R^2 value of 0.55, showing that it's less correlated with the S&P 500 than Microsoft but more so than Tesla.

THANK YOU

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