

Stock Data Description

THE LIVE DATA STOCK VALUES OF 3 MAJOR COMPANIES MICROSOFT, APPLE AND TESLA. THEIR LIVE DATA HAVE BEEN EXTRACTED FROM THE WEBSITE OF YAHOO FINANCE. THE DATASET CONTAINS THEIR STOCK VALUES BETWEEN 2018 AND 2023 ON DAILY BASIS. THE DATASET ALSO CONTAIN S&P 500 VALUES AS WELL, DURING THE SAME TIME. HERE THE PERCENTAGE CHANGE IN STOCK VALUES HAS BEEN CALCULATED FOR EACH STOCK AND IS PRESENTED IN THE TABLE AS %CHANGE VARIABLE.



Objectives

01

Make a comparative descriptive statistics on the price value of each stock displaying charts to show the trend of each stock between (2018 – 2023)

02

Include charts like scatter plot, histogram etc to show the price trend of each of the stock value. 03

Compare the stock values of each company with the SP_500 company.

04

A regression analysis of each stock value

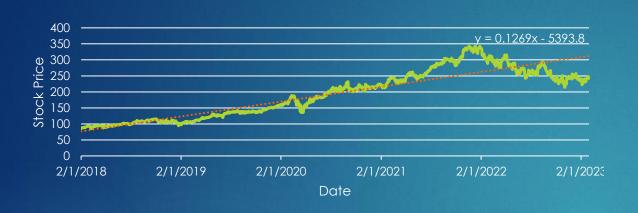
Microsoft Statistical Analysis

- ▶ The average of the MSFT closing stock price is 194.51 and the standard deviation is 75.19. This tells you that the dataset has a central tendency around 194.5 but also some significant variability, as the standard deviation is quite large relative to the mean.
- ▶ The median of the closing stock price is 203 while the mode is 92.33
- Variance shows how much the returns of a stock fluctuate. MSFT has high variance indicating high risk stock and its more volatile.
- Kurtosis, skewness, and range are statistical measures used to describe the shape, distribution, and spread of a dataset.
- ▶ Low kurtosis (Platykurtic) of -1.29 suggests that the data has lighter tails and is flatter in the middle, with fewer outliers. Negative skewness: 0.15 The mean is less than the median, and the distribution leans toward the right with a long-left tail.
- A large range of 285 indicates a wide spread of data points, suggesting more variability.

Descriptive Statistics	Open	High	Low	Close	Adj Close	Volume	%Change
	•				•		
Mean	194.47	196.52	192.30	194.51	190.83	30 M	0.00
Standard Error	2.08	2.10	2.05	2.08	2.10	0 M	0.00
Median	203.58	205.19	201.32	203.05	198.82	27 M	0.00
Mode	95.14	107.90	89.66	92.33	89.88	23 M	#N/A
Standard Deviation	74.23	75.00	73.40	74.24	75.19	13 M	0.02
Sample Variance	5510.45	5625.40	5387.52	5511.86	5653.29	165,045,943 M	0.00
Kurtosis	-1.29	-1.30	-1.28	-1.29	-1.31	5.75	2.38
Skewness	0.15	0.14	0.15	0.15	0.14	2.02	-0.21
Range	258.56	263.36	258.37	258.10	259.87	102 M	0.17
Minimum	86.06	86.31	83.83	85.01	80.06	9 M	-0.08
Maximum	344.62	349.67	342.20	343.11	339.92	111 M	0.08
Sum	248533.81	251155.98	245761.76	248584.48	243876.63	38,682 M	1.25
Count	1278	1278	1278	1278	1278	1278	1277

MSFT Regression Analysis

MSFT Stock price trend







From 2018 to 2023, Microsoft experienced a strong upward trend in its stock price.

Higher Trading Volume over the years Indicates increased interest in the stock.

MSFT Regression Statistics

SUMMARY OUTPUT

Regression Statistics							
Multiple R	0.0663						
R Square	0.0044						
Adjusted R Square	0.0036						
Standard Error	74.8882						
Observations	1229						

ANOVA

Y MARKET BUT	df	SS	MS	F	Significance F
Regression	1	30410.49	30410.49	5.42	0.02
Residual	1227	6881310.73	5608.2402		
Total	1228	6911721.22			

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	Coefficients	Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0% L	<i>Jpper 95.0%</i>
Intercept	204.48	5.47277	37.36251	0.00000	193.73946	215.21351	193.73946	215.21351
22483800	-3.9E-07	0.00000	-2.32862	0.02004	0.00000	0.00000	0.00000	0.00000

Tesla Statistical Analysis

- ▶ The average of the Tesla closing stock price is 131.79 and the standard deviation is 116.98. This tells you that the dataset has a central tendency around 131.79 but also some significant variability, as the standard deviation is quite large relative to the mean.
- ▶ The median of the closing stock price is 97.64 while the mode is 23.62
- Variance shows how much the returns of a stock fluctuate. Tesla has high variance indicating high risk stock and its more volatile.
- Kurtosis, skewness, and range are statistical measures used to describe the shape, distribution, and spread of a dataset.
- Low kurtosis (Platykurtic) of -1.26 suggests that the data has lighter tails and is flatter in the middle, with fewer outliers. **Positive Skewness** (Right-skewed): 0.47 The right tail (larger values) is longer than the left tail. This means that there are more low or moderate values, but the few larger values skew the distribution.
- A large range of 398 indicates a wide spread of data points, suggesting more variability.

Descriptive	0.75	I l'ala		Class	A -1: Cl	Malaura	0/ -
<u>Statistics</u>	Open	High	Low	Close	Adj Close	Volume	%change
Mean	131.90	134.96	128.51	131.79	131.79	133M	0.00
Standard Error	3.28	3.35	3.19	3.27	3.27	3M	0.00
Median	96.57	100.32	94.27	97.64	97.64	103M	0.00
Mode	24.00	21.50	21.77	23.62	23.62	130M	0.00
Standard Deviation	117.17	119.82	114.14	116.98	116.98	90M	0.04
Sample Variance	13728.01	14356.09	13027.37	13684.08	13684.08	8,087,555,501M	0.00
Kurtosis	-1.26	-1.25	-1.27	-1.26	-1.26	9.96	4.12
Skewness	0.47	0.47	0.47	0.47	0.47	2.46	0.41
Range	399.40	402.05	393.87	398.04	398.04	885M	0.52
Minimum	12.07	12.45	11.80	11.93	11.93	29M	-0.21
Maximum	411.47	414.50	405.67	409.97	409.97	914M	0.31
Sum	168562.08	172476.84	164238.12	168427.98	168427.98	170,431M	3.35
Count	1278	1278	1278	1278	1278	1278	1277

Tesla Regression Analysis







From 2018 to 2023, Tesla experienced a strong upward trend in its stock price.

Higher Trading Volume over the years Indicates increased interest in the stock.

Tesla Regression Statistics

SUMMARY OUTPUT

Regression Statistics						
Multiple R	0.36					
R Square	0.13					
Adjusted R Square	0.13					
Standard Error	111.04					
Observations	1229					

ANOVA

	df	SS	MS	F	Significance F
Regression	1	2284207.46	2284207.46	185.27	2.12539E-39
Residual	1227	15127623.94	12328.95		
Total	1228	17411831.4			

Children Produces	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	194.0980949	5.60	34.65	5.5E-184	183.11	205.09	183.11	205.09
65283000	-4.74178E-07	3.48367E-08	-13.61145948	2.13E-39	-5.42524E-07	-4.05832E-07	-5.42524E-07	-4.05832E-07

Apple Statistical Analysis

- The average of the Apple closing stock price is 98.65 and the standard deviation is 46.57. This tells you that the dataset has a central tendency around 98.65 but also some significant variability, as the standard deviation is quite large relative to the mean.
- The median of the closing stock price is 95.62 while the mode is 145.86
- Variance shows how much the returns of a stock fluctuate. Apple has high variance indicating high risk stock and its more volatile.
- Kurtosis, skewness, and range are statistical measures used to describe the shape, distribution, and spread of a dataset.
- Low kurtosis (Platykurtic) of -1.58 suggests that the data has lighter tails and is flatter in the middle, with fewer outliers. **Positive Skewness** (Right-skewed): 0.12 The right tail (larger values) is longer than the left tail. This means that there are more low or moderate values, but the few larger values skew the distribution.
- A large range of 146.26 indicates a wide spread of data points, suggesting more variability.

Descriptive							
Statistics	Open	High	Low	Close	Adj close	Volume	%change
Mean	98.57	99.78	97.42	98.65	97.39	116M	0.00
Standard Error	1.29	1.31	1.27	1.29	1.30	2M	0.00
Median	95.09	96.31	93.98	95.62	94.15	102M	0.00
Mode	127.82	151.57	133.77	145.86	41.25	119M	#N/A
Standard							
Deviation	46.18	46.77	45.57	46.19	46.57	55M	0.02
						3,016,364,445	
Sample Variance	2132.24	2187.72	2076.34	2133.62	2168.54	M	0.00
Kurtosis	-1.58	-1.58	-1.58	-1.58	-1.58	5.66	2.48
Skewness	0.12	0.12	0.12	0.12	0.12	2.03	-0.15
Range	146.64	146.51	143.62	146.46	146.65	391M	0.18
Minimum	35.99	36.43	35.50	35.55	34.31	35M	-0.09
Maximum	182.63	182.94	179.12	182.01	180.96	427M	0.10
		127516.3					
Sum	125977.71	1	124506.26	126070.25	124462.16	148,530M	1.50
Count	1278	1278	1278	1278	1278	1278	1277

Apple Regression Analysis







From 2018 to 2023, Tesla experienced a strong upward trend in its stock price.

Higher Trading Volume over the years Indicates increased interest in the stock.

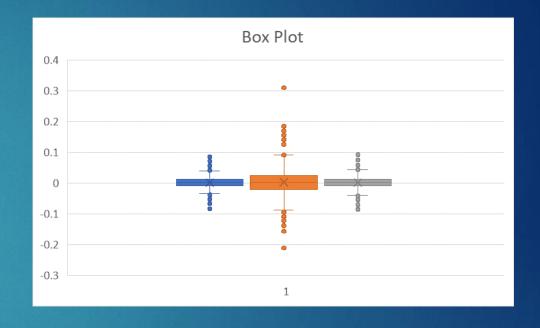
Apple Regression Statistics

SUMMARY OUTPUT								
Regression	Statistics							
Multiple R	0.33							
R Square	0.11							
Adjusted R Square	0.11							
Standard Error	43.86							
Observations	1229							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	279329.51	279329.51	145.20	1.10194E-31			
Residual	1227	2360398.66	1923.72	140.20	1.101746 01			
Total	1228	2639728.18	1720.72					
TOTAL	1220	2007720.10						
		Standard						
	Coefficients	Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	129.30	2.95	43.86	1.519E-253	123.51	135.08	123.51	135.08
102223600	-2.7E-07	2.3E-08	-1.2E+01	1.1E-31	-3.2E-07	-2.3E-07	-3.2E-07	-2.3E-07

Comparison Chart



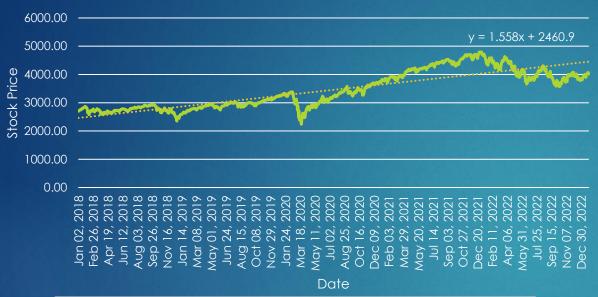




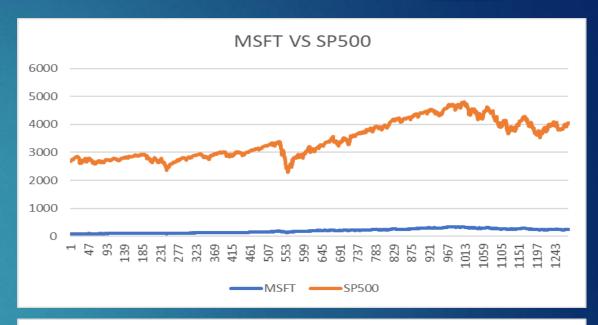
Microsoft and Apple stock have the same trend compared to Tesla which is more volatile, has very high price fluctuations and more outliers.

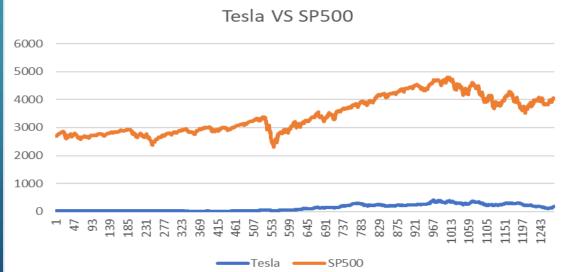
SP500 trend and comparison











Conclusion

- Descriptive Statistics: Showed that Tesla exhibited the most volatility, while Microsoft and Apple displayed steady growth. Visualizations: Demonstrated consistent upward trends for all stocks, with significant fluctuations for Tesla. Regression Analysis: Highlighted overall positive growth, with Tesla having the steepest trend.
- Microsoft and Apple provide s table growth with moderate risk, suitable for long –term investors. Tesla offers high-reward potential but comes with significant risks and price volatility. S&P500 represents the overall market's stability, making it a safer option with lower returns compared to individual s tocks.