

# About Me

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- Proficient in **Python, SQL, Tableau, and Power BI**
- Pursuing a **Diploma in Data Analysis** from **Hyper Island**  
(2023-2025)
- Experienced in teaching statistics
- Skilled in **data visualization** and **predictive modeling**

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# AGENDA

- Introduction
- Data Overview
- Descriptive Statistics
- Data Visualization
- Regression Analysis
- Conclusion

# Introduction

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- This project analyzes stock price data for companies like Apple, Microsoft, and Tesla from 2018 to 2023.

## Dataset Overview:

- The dataset includes columns for daily stock prices, percentage change (%change), and S&P 500 values.

## Objective:

- The goal of this project is to study stock trends, calculate key statistics (mean, median, etc.), and compare the stocks' performance with the S&P 500 index. Additionally, a regression analysis is done to assess the risk and return of each stock.

	A	B	C	D	E	F	G	H
1	Date	Open	High	Low	Close	Adj Close	Volume	Tesl%change
2	2/1/2018	20.799999	21.474001	20.733334	21.368668	21.368668	65283000	
3	3/1/2018	21.4	21.683332	21.036667	21.15	21.15	67822500	0.028846203
4	4/1/2018	20.858	21.236668	20.378668	20.974667	20.974667	149194500	-0.0253271
5	5/1/2018	21.100	21.140000	20.700000	21.105000	21.105000	60000000	0.011005000

# Descriptive Statistics

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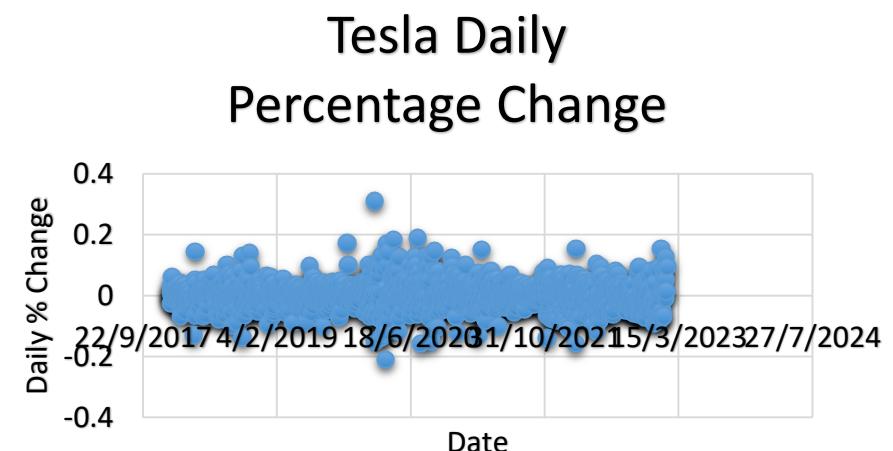
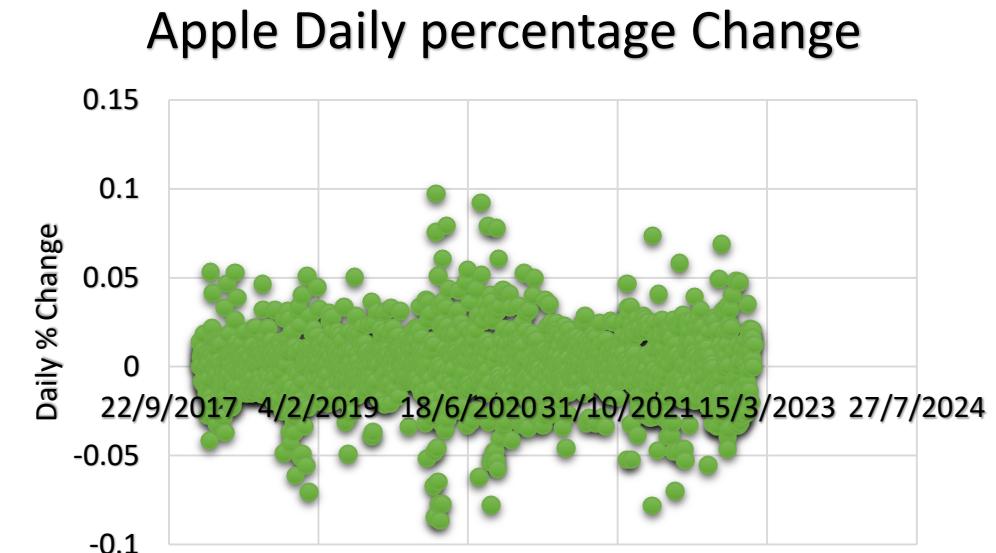
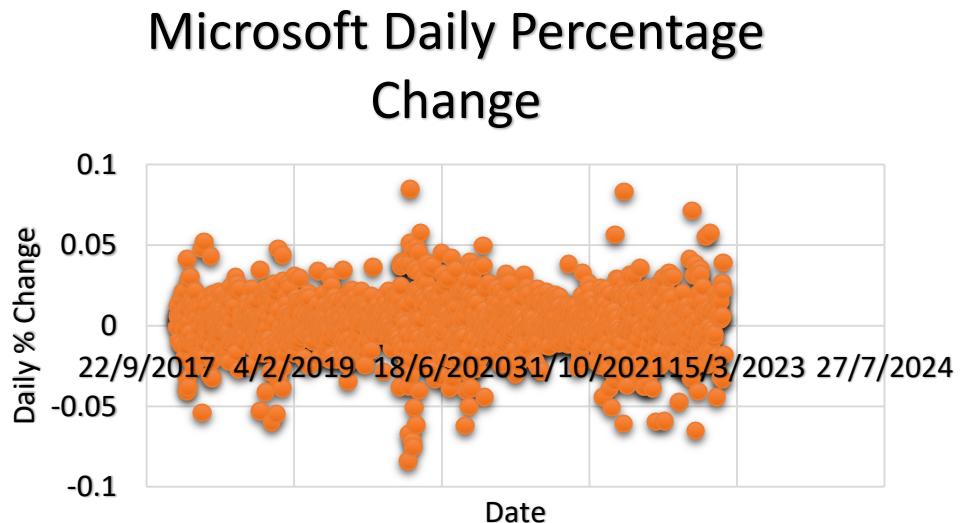
For descriptive statistics, I used the **Close** column because it shows the final price at the end of each trading day, which is a key indicator for analyzing stock performance. According to the table, the average price of the S&P 500 index is around 3457.23. Among the companies, Apple shows the highest average price compared to Microsoft and Tesla, although the maximum stock prices belong to Tesla and Microsoft, respectively. . This means that, on average, Apple's stock price has been consistently higher over the period analyzed, suggesting stronger market performance or greater investor confidence in the company. Furthermore, Tesla has the highest variance and standard deviation, indicating that its stock price experiences more volatility compared to the other companies. This means that Tesla's stock price fluctuates more significantly than the other stocks, while Apple's stock shows more stability.

Additionally, the count for each stock and S&P 500 is 1278, which indicates that there are no missing data points for the period analyzed, ensuring a consistent and reliable comparison across all Companies.

Column1	Column2	Column3	Column4	Column5
(2018-2023)	MSFT	Tesla	Apple	SP500
Mean	194.5105477	131.7902812	98.64651602	3457.230055
Mode	92.330002	23.620667	145.860001	2783.02
Median	203.050003	97.6400035	95.6150015	3398.03
MIN	85.010002	11.931333	35.547501	2237.4
Max	343.19985	409.970001	182.009995	4796.56
Variance	5507.551495	13673.37337	2131.948322	444245.9086
STDEV	74.21287956	116.9332005	46.17302592	666.5177482
Count	1278	1278	1278	1278

# Daily Stock Volatility: Microsoft, Apple, and Tesla

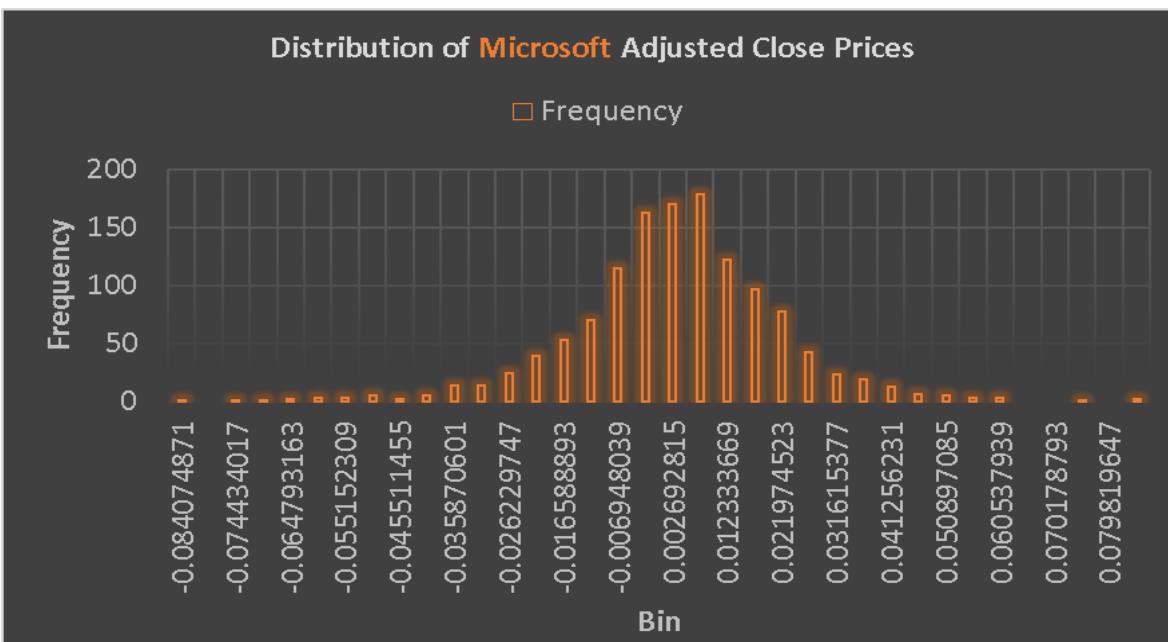
**Microsoft** shows the most stability, with minimal daily changes mostly between **-2% to +2%**. **Apple** is similar but has slightly more fluctuations, especially around product launches. **Tesla**, however, is highly volatile, with daily changes often exceeding **±10%**, offering higher potential gains but with more risk. In short, Microsoft and Apple are stable, while Tesla is riskier but with greater upside.



# Distribution of Adjusted Close Prices for Apple, Tesla, Microsoft, and S&P 500 (2018-2023)

## Apple:

The distribution of Apple's adjusted close prices shows a roughly normal pattern, where most of the prices are concentrated in the middle range, between -0.01 and 0.02. This bell-shaped curve indicates that the prices were fairly stable over this period, with most values centered around the mean.



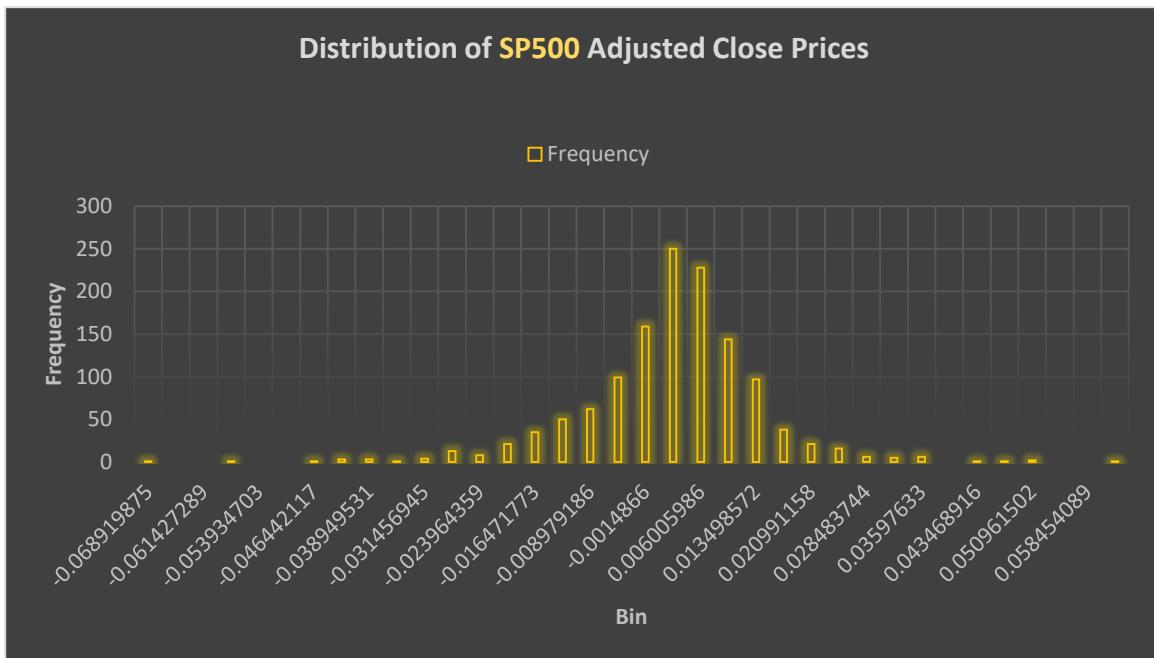
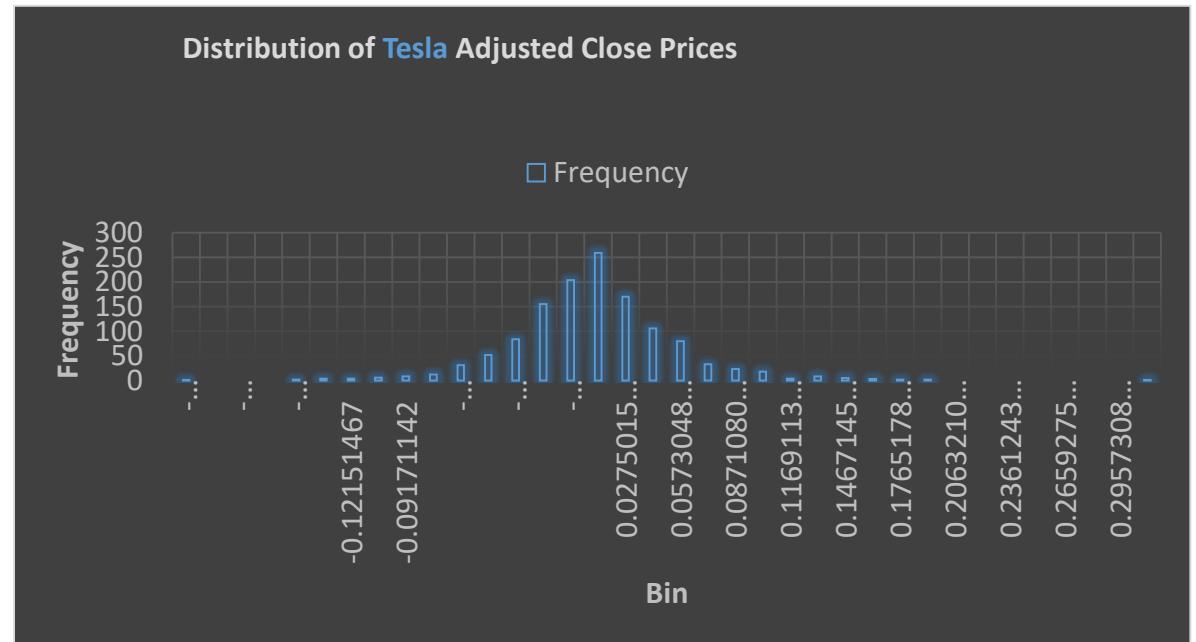
## Microsoft :

Microsoft's distribution, like Apple's, also follows a normal-like curve with most of the data centered between -0.01 and 0.02. This suggests that Microsoft's stock prices were also relatively stable, with most of the price changes falling within a narrow range

## Tesla :

Tesla's price distribution has more variance compared to Apple. Although we see a similar central peak, there is more spread, especially towards higher values.

This wider distribution suggests that Tesla experienced more significant price swings during this period.



## S&P 500 :

The S&P 500 distribution shows a similar bell-shaped pattern, with prices concentrated in the middle range around 0.01.

This normal distribution reflects that, despite market fluctuations, the index remained relatively stable over time, with a central tendency.

# A Regression and Correlation Study: How Apple's Stock Moves with the Market

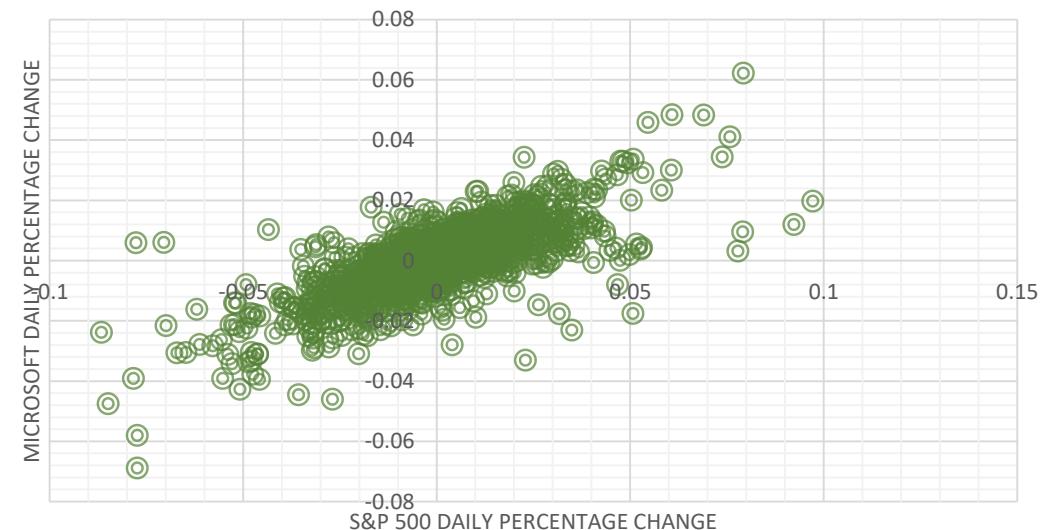
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This regression and correlation analysis shows a **moderate positive relationship** between Apple's daily percentage changes and the S&P 500. The **R-squared value of 0.55** means that **55%** of Apple's stock movement is explained by changes in the S&P 500, indicating a fairly strong connection to the market.

The **Beta value of 1.34** shows that Apple's stock is more volatile than the market, meaning it experiences bigger swings. For every 1% change in the S&P 500, Apple's stock changes by 1.34%.

The very low **P-value** confirms that the relationship between Apple's stock and the S&P 500 is **statistically significant**, meaning it's unlikely that this correlation is due to chance

Correlation Between Apple Stock and S&P 500 Daily Percentage Change



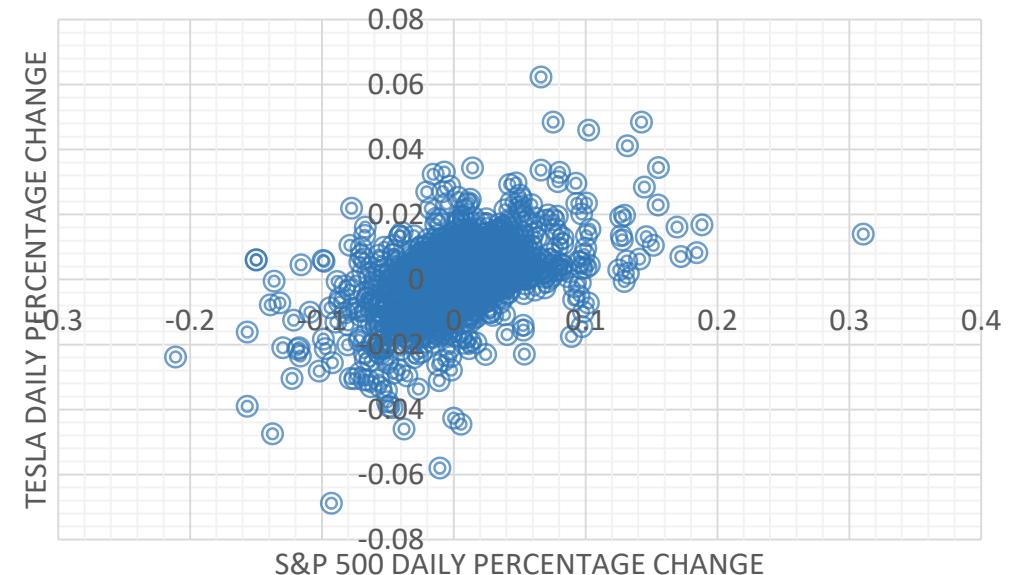
Regression Statistics	Value
R-Squared	0.55
Beta	1.34
P-value	7.50E-223

# A Regression and Correlation Study: How Tesla's Stock Moves with the Market

The scatter plot shows a **moderate positive correlation** between Tesla's daily percentage changes and the S&P 500. The **R-squared value of 0.23** indicates that only **23%** of Tesla's stock movement is explained by the S&P 500, suggesting other factors play a role.

With a **Beta of 1.83**, Tesla's stock is much more volatile than the market, meaning it is highly sensitive to market movements. The **very low P-value** confirms that this relationship is **statistically significant** despite the lower R-squared value.

Correlation Between Tesla Stock and S&P 500 Daily Percentage Change



Regression Statistics	Value
R-squared	0.23
Beta	1.83
P-value	4.91E-75

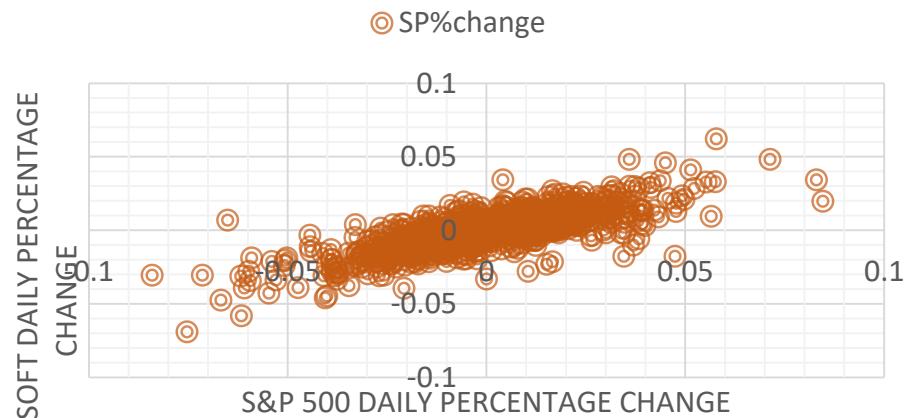
# A Regression and Correlation Study: : How Microsoft's Stock Moves with the Market

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This scatter plot shows a strong positive relationship between Microsoft's daily percentage changes and the S&P 500. With a Beta of 1.22, Microsoft's stock tends to be more volatile than the market and moves in the same direction as the S&P 500. The R-squared value of 0.6 indicates that 60% of Microsoft's stock changes can be explained by the movements of the S&P 500, showing a strong correlation between the two. Additionally, the very low P-value confirms that this relationship is statistically significant

**When comparing the three scatter charts, Tesla shows the most volatility** with a wide spread of data points, indicating larger and more unpredictable price swings compared to the S&P 500. **Apple** has moderate **volatility**, while **Microsoft** shows the **least spread** and closest alignment with the S&P 500, reflecting more **stable and predictable** stock movements.

Correlation Between Microsoft Stock and S&P 500 Daily Percentage Change



Regression Statistics	Value
R-squared	0.6
Beta	1.22
P-value	9.70E-259

# Conclusion:

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From the analysis of these three companies, it's clear that:

- **Microsoft** is the most stable stock, with a strong relationship to the market and moderate volatility, making it a safer investment option.
- **Tesla** is highly volatile and less dependent on market changes, making it a higher-risk, higher-reward stock.
- **Apple** strikes a balance between the two, showing moderate volatility and a fairly strong connection to the market.

# Recomendation:

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## 1. For Conservative Investors:

- **Microsoft** is the best option due to its stability and strong alignment with the market.

## 2. For Risk-Taking Investors:

- **Tesla** is ideal for those seeking higher rewards, as it offers significant upside potential but comes with high volatility.

## 3. For Balanced Investors:

- **Apple** is a good middle-ground investment, offering both growth potential and a relatively strong market correlation

Thank  
You

