Stock Performance Analysis Project: Apple vs Tesla

This project analyzes the financial performance, risk, and return characteristics of Apple (AAPL) and Tesla (TSLA) over the selected time period using R. It includes data cleaning, return calculations, volatility measurement, risk–return evaluation, and visual analysis.

1. Objectives

- Compare long-term performance (CAGR) of Apple vs. Tesla
- Analyze daily and monthly returns
- Measure stock risk using volatility
- Understand risk–return trade-offs
- Provide insights on investment behavior
- Visualize and summarize key findings

2. Data Preparation

- Imported historical stock data
- Converted Date to correct format
- Calculated daily returns using: DailyReturn = (Close - lag(Close)) / lag(Close)

Grouped and summarized monthly returns
Combined Apple & Tesla data for comparison

3. Key Metrics Calculated

A. CAGR (Long-term performance)

Formula: CAGR = (Ending Price / Beginning Price)^(1/Years) - 1

Results:

Tesla CAGR: 0.1939586 (19.39%)

Apple CAGR: 0.1829424 (18.29%)

Interpretation: Tesla has slightly higher long-term performance.

B. Mean Daily Return (Average short-term return)

Shows the average of daily returns over the entire period.

Results :

Tesla : 0.0006697089

Apple: 0.0007066593

C. Volatility (Risk)

Annualized Volatility: sd(DailyReturn) * sqrt(252)

Higher volatility = higher uncertainty

Shows how much returns fluctuate day-to-day

Result: Apple: 0.28 Tesla: 0.60

D. Sharpe Ratio (Risk-adjusted return)

Formula: Sharpe = (Mean Return - RiskFreeRate) / Volatility

Tesla had lower Sharpe

Apple had higher Sharpe → Apple gives better returns per unit of risk

Result: Apple: 0.510 Tesla: 0.252

E. Correlation

Measures how similarly two stocks move.

Formula:cor(apple_returns, tesla_returns)

Positive correlation = move in same direction

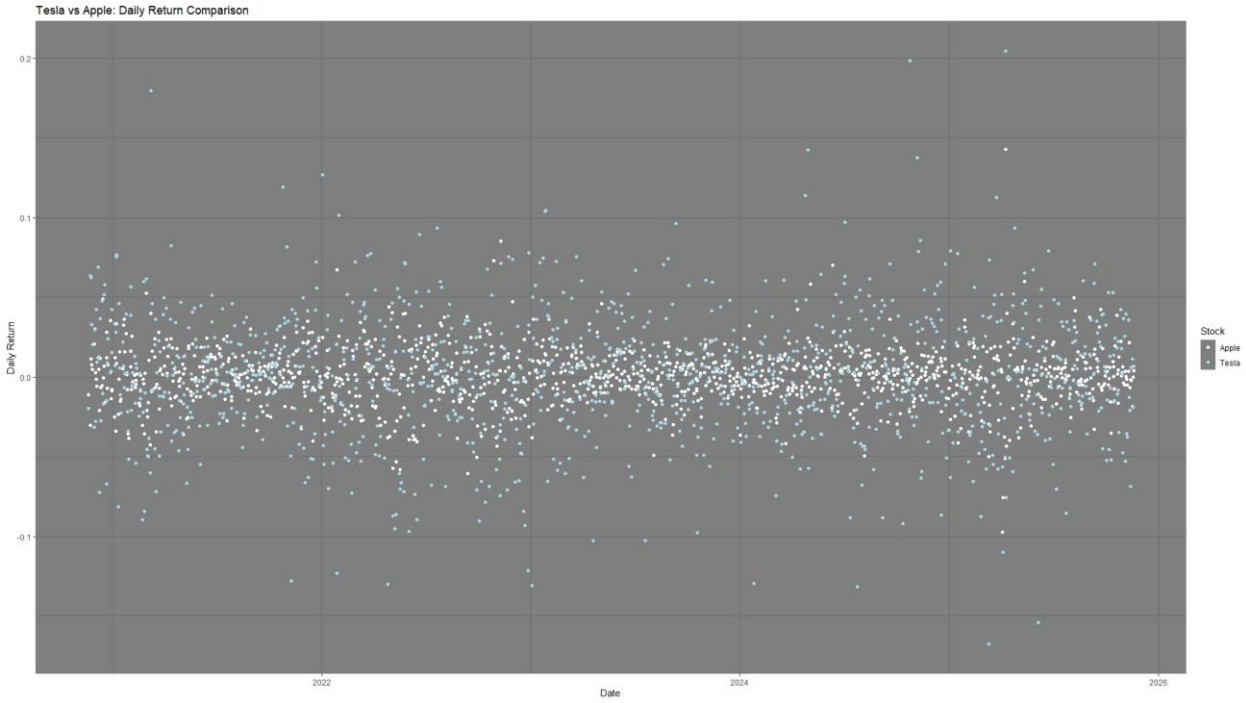
Negative = opposite

Near zero = unrelated

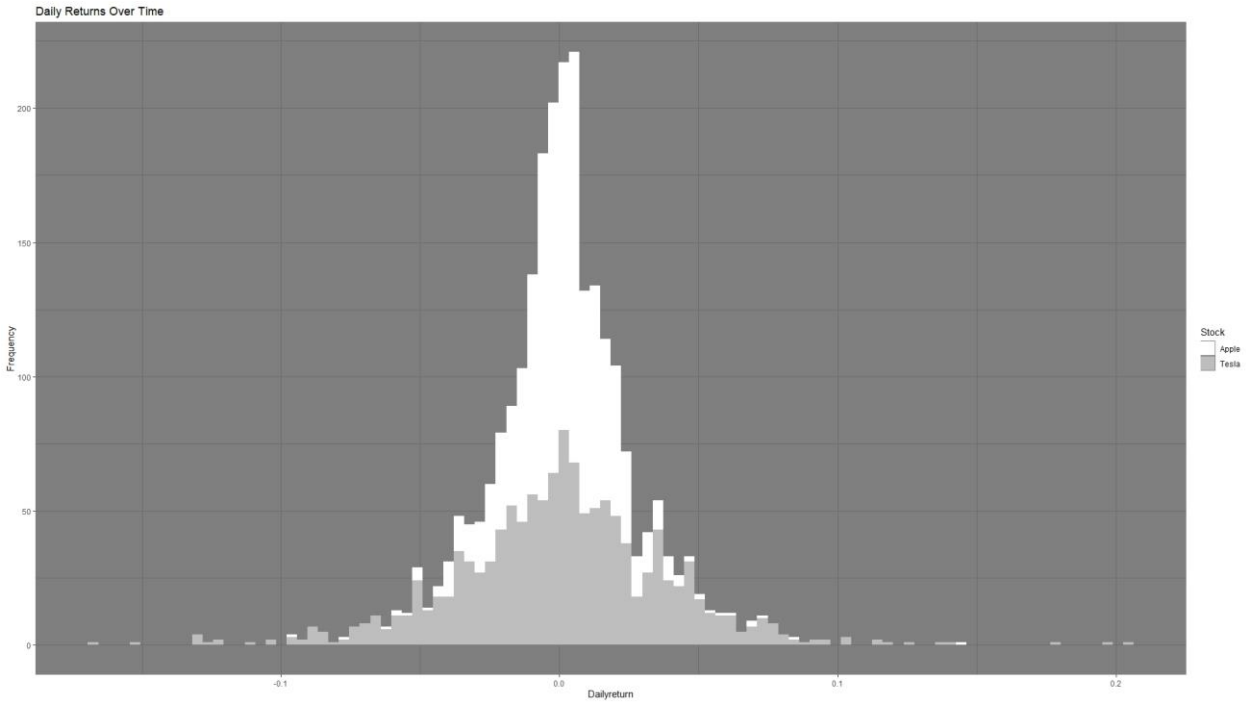
Result: Correlation: 0.4900

4. Graphical Analysis

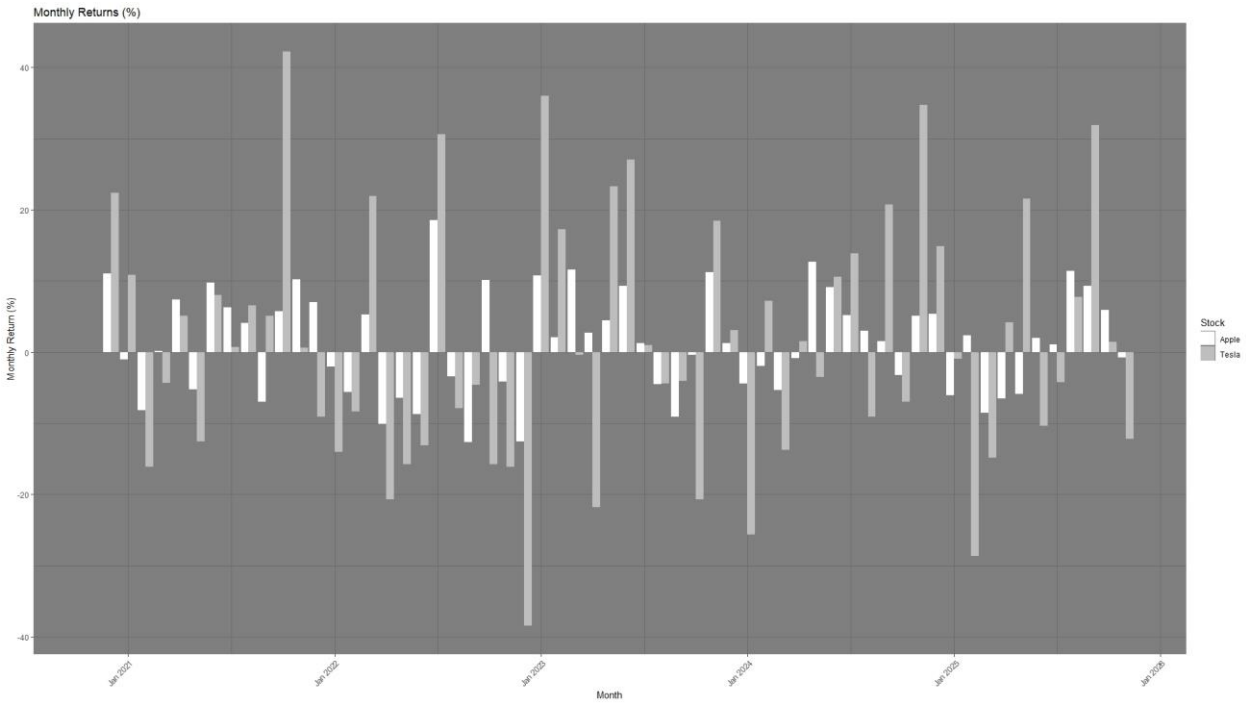
Plot 1: Daily Returns Over Time (Apple vs Tesla)



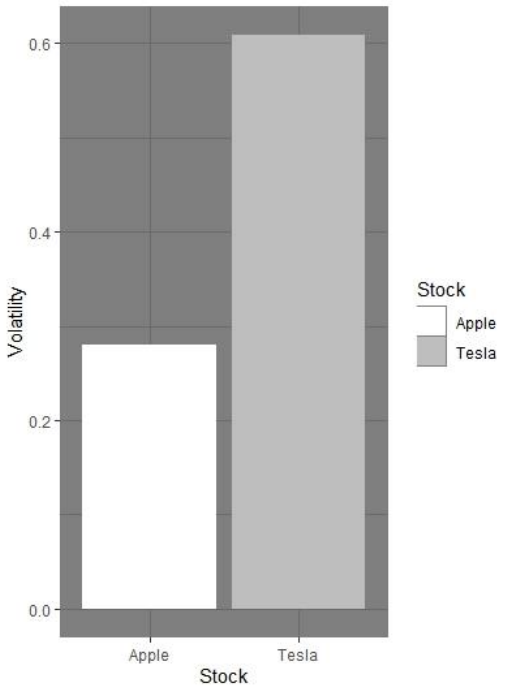
Plot 2: Daily Returns Histogram



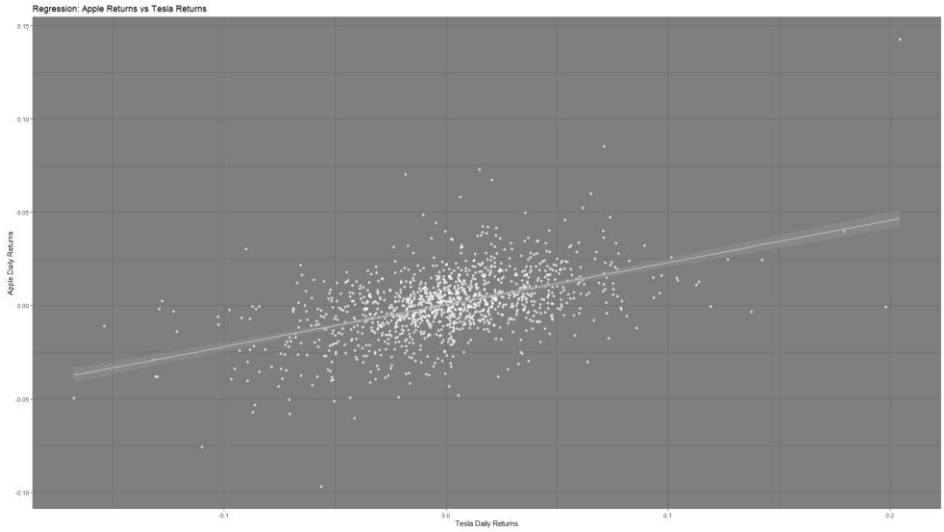
Plot 3: Monthly Returns Bar Chart



Plot 4: Volatility Comparison (Apple vs Tesla)



Plot 5: Regression



5. Insights & Interpretations

a. Risk vs Return:

Tesla gives higher return but also higher volatility (risk)

Apple delivers more stable performance with better risk-adjusted return (Sharpe ratio)

b. Long-term Performance:

Tesla slightly outperforms Apple in CAGR

But Apple is more consistent → better for conservative investors

c. Investment Behavior:

Tesla behaves like a high-growth, high-risk stock

Apple behaves like a stable, lower-risk stock

Diversifying across both may reduce risk

6. Conclusion:

This project covers important financial analysis skills:

Return calculations

Volatility/risk measurement

Data visualization

Risk–return interpretation

Basic portfolio analysis

NOTE:- Sources of the last 5 year data has been taken from Stooq (www.Stooq.com)

By, Himanshu Prasad

(A small try on the financial data analysis of Tesla and Apple from analyzing last 5 year. It gives a little clarity on the financial behaviour of the stocks. I tried covering some major finacial calculations, graph plotting and interpretation of these stocks.)