

STOCK MARKET STORYTELLING:

APPLE, THE S&P 500, AND WHAT

THE DATA REVEALS



WHAT DID I DO?

TO BEGIN THIS PROJECT, I COLLECTED HISTORICAL STOCK DATA USING THE YFINANCE PYTHON LIBRARY. IT PROVIDES EASY ACCESS TO FINANCIAL DATA FROM [YAHOO FINANCE](#) DIRECTLY INTO A DATAFRAME FORMAT.

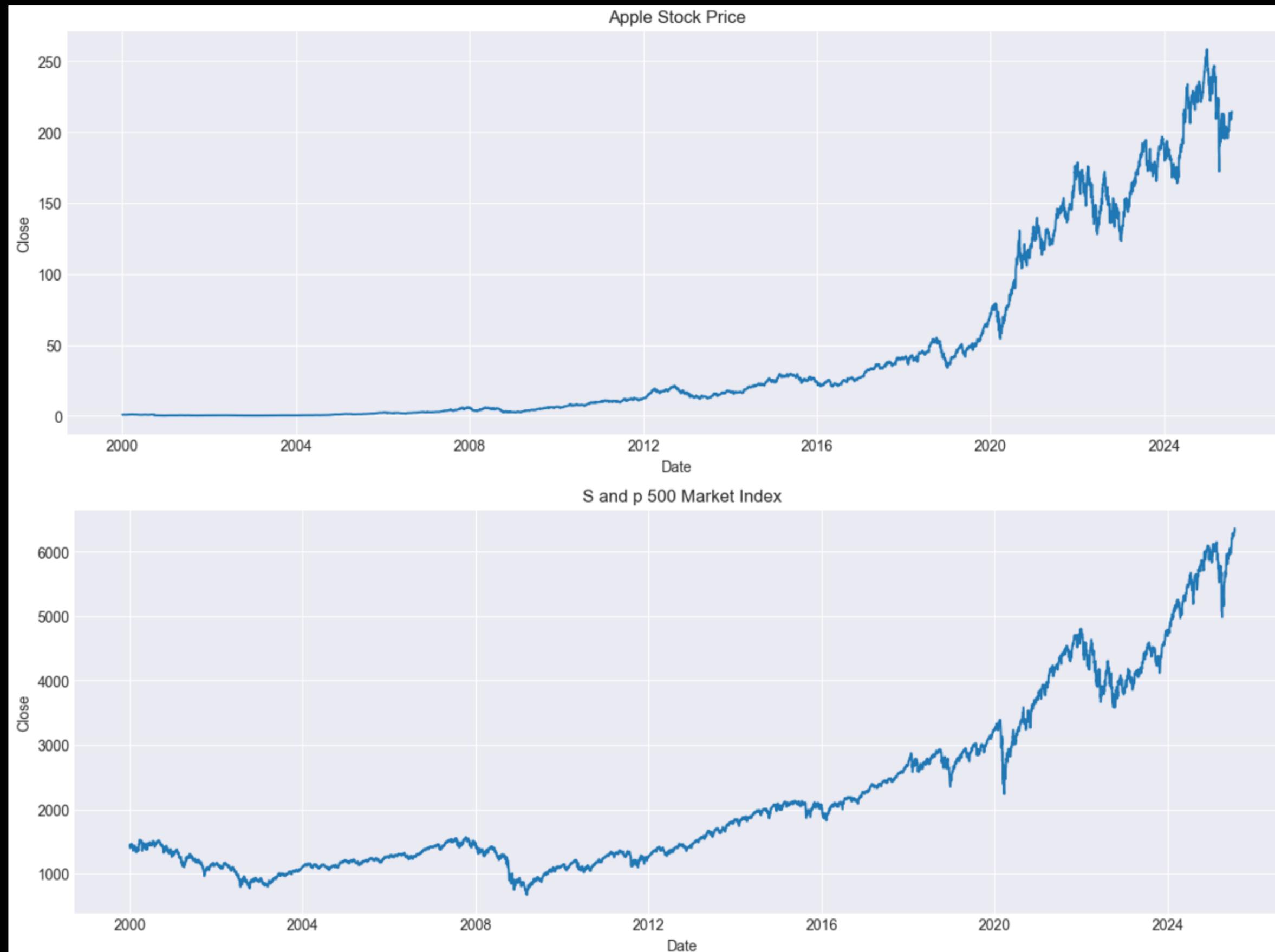
I EXTRACTED:

- APPLE INC. (AAPL) STOCK DATA
- S&P 500 INDEX (^GSPC) DATA
- INCLUDING FIELDS LIKE OPEN, HIGH, LOW, CLOSE, VOLUME, DIVIDENDS, AND STOCK SPLITS

BELOW IS THE CODE I USED WITH THE YFINANCE LIBRARY TO FETCH THE STOCK DATA FOR APPLE AND THE S&P 500.

```
! pip install yfinance
import yfinance as yf
import pandas as pd
import numpy as np
aapl= yf.Ticker("aapl")
sandp500 = yf.Ticker("^GSPC")
aapl_historical = aapl.history(start="2000-01-01",interval="1d")
sandp500_historical = sandp500.history(start="2000-01-01",interval="1d")
```

THE LINE PLOTS BELOW SHOW THE HISTORICAL CLOSING PRICES OF APPLE AND THE S&P 500 OVER TIME, ALLOWING FOR A VISUAL COMPARISON OF THEIR MARKET PERFORMANCE.



I PLOTTED APPLE'S AND THE S&P 500'S HISTORICAL CLOSING PRICES ON THE SAME GRAPH TO VISUALIZE THEIR MARKET TRENDS OVER TIME.

HOWEVER, SINCE THEIR ABSOLUTE PRICE LEVELS DIFFER SIGNIFICANTLY, THIS CHART DOESN'T ALLOW FOR A DIRECT COMPARISON OF THEIR PERFORMANCE.



PRICE LEVELS VARY → SOLUTION: REBASING

WHAT IS REBASING?

```
sandp500_historical["Close_Rescaled"] = (sandp500_historical["Close"] / sandp500_historical["Close"].iloc[0]) * 100  
aapl_historical["close_Rescaled"] = (aapl_historical["close"] / aapl_historical["close"].iloc[0]) * 100
```

REBASING IS THE PROCESS OF CONVERTING A TIME SERIES (LIKE STOCK PRICES) TO A COMMON STARTING VALUE — USUALLY 100 — TO MAKE RELATIVE COMPARISONS EASIER.

THE LOGIC BEHIND REBASING

DIFFERENT ASSETS (LIKE APPLE STOCK AND THE S&P 500 INDEX) OFTEN HAVE VERY DIFFERENT PRICE LEVELS. FOR EXAMPLE:

- APPLE MIGHT START AT \$150
- S&P 500 MIGHT START AT \$3,000

IF WE JUST PLOT THEIR RAW PRICES, IT'S HARD TO TELL WHICH ONE GREW MORE OVER TIME.

REBASING TRANSFORMS EACH DATA POINT INTO A PERCENTAGE OF THE STARTING VALUE, SO BOTH SERIES START AT 100. THIS WAY, WE CAN:

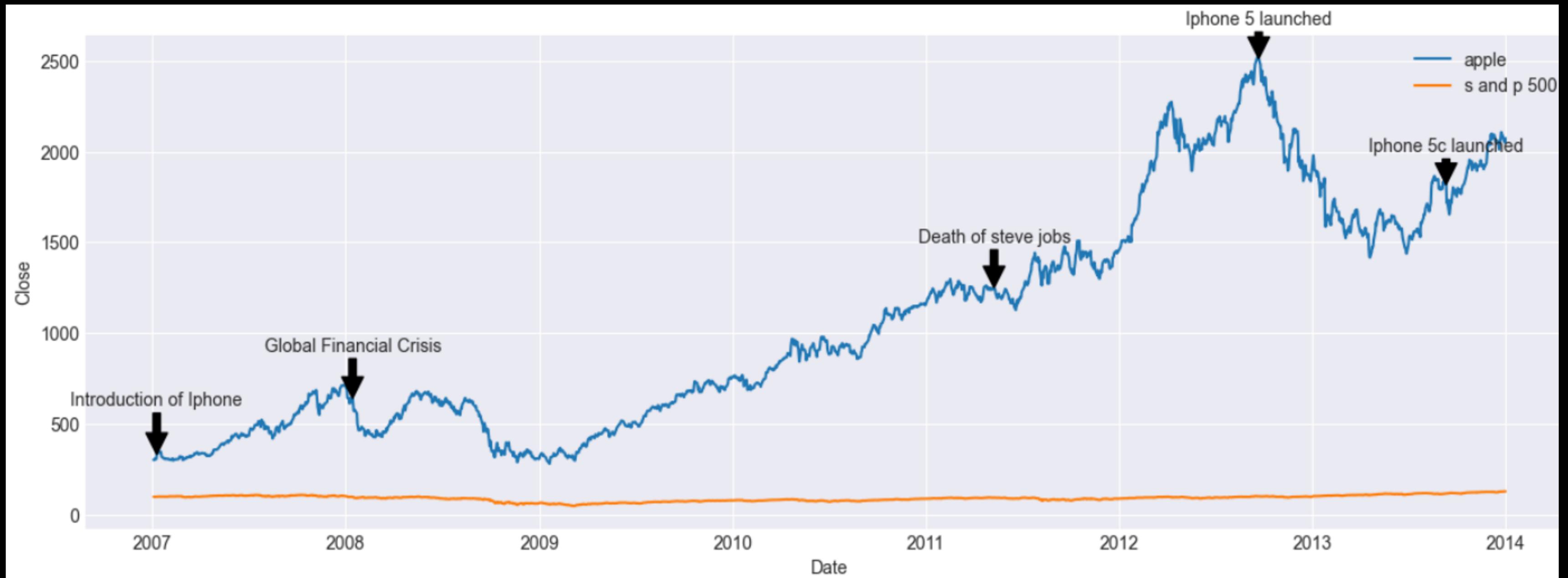
- SEE HOW MUCH EACH ASSET HAS INCREASED/DECREASED OVER TIME
- FOCUS ON PERFORMANCE, NOT PRICE LEVEL
- COMPARE APPLES TO APPLES — LITERALLY!

TO MAKE THE COMPARISON MEANINGFUL, WE NEED TO REBASE BOTH SERIES TO START AT THE SAME VALUE (E.G., 100). THIS ALLOWS US TO ANALYZE THEIR RELATIVE GROWTH OVER TIME, REGARDLESS OF THEIR ORIGINAL PRICE SCALES.



IN THIS PLOT, I FOCUSED ON THE PERIOD FROM 2007 TO 2014, A CRITICAL PHASE IN APPLE'S HISTORY MARKED BY MAJOR EVENTS. I CHOSE THIS TIMEFRAME BECAUSE:

- IT INCLUDES KEY MILESTONES LIKE THE INTRODUCTION OF THE IPHONE (2007) AND THE DEATH OF STEVE JOBS (2011)
- THESE EVENTS HAD A SIGNIFICANT IMPACT ON APPLE'S STOCK MOVEMENT
- THE RANGE IS CONCISE ENOUGH TO ANALYZE IN DETAIL AND VISUALLY ANNOTATE FOR CLARITY



BETWEEN 2007 AND 2014, APPLE'S STOCK PRICE SHOWED SIGNIFICANT MOVEMENTS INFLUENCED BY MAJOR EVENTS, AS SEEN IN THE CHART.

THE **INTRODUCTION OF THE IPHONE IN 2007** MARKED A MAJOR BREAKTHROUGH FOR APPLE, LEADING TO A STEADY UPWARD TREND IN ITS STOCK PRICE AS THE MARKET RESPONDED POSITIVELY TO ITS INNOVATION.

HOWEVER, DURING **THE 2008 GLOBAL FINANCIAL CRISIS**, APPLE'S STOCK—LIKE THE BROADER S&P 500 INDEX—EXPERIENCED A SHARP DECLINE, REFLECTING WIDESPREAD MARKET PANIC. DESPITE THIS, APPLE RECOVERED MORE STRONGLY THAN THE INDEX, DEMONSTRATING INVESTOR CONFIDENCE IN ITS LONG-TERM GROWTH.

IN 2011, **THE DEATH OF STEVE JOBS** CAUSED A TEMPORARY DIP IN APPLE'S STOCK, DRIVEN BY UNCERTAINTY ABOUT THE COMPANY'S FUTURE LEADERSHIP. YET THE PRICE QUICKLY REBOUNDED, INDICATING CONTINUED TRUST IN APPLE'S PRODUCT PIPELINE.

THE **LAUNCH OF THE IPHONE 5** IN 2012 TRIGGERED A SHARP RISE IN THE STOCK, REACHING NEW HIGHS DUE TO STRONG MARKET RECEPTION. IN CONTRAST, THE LAUNCH OF THE **IPHONE 5C** IN 2013 RESULTED IN ONLY A MODERATE RECOVERY AFTER A DECLINE, AS THE PRODUCT FAILED TO GENERATE THE SAME EXCITEMENT.

RETURNS: TRACKING GAINS AND LOSSES DAILY

AFTER ANALYZING THE PRICE TRENDS, I CALCULATED DAILY RETURNS FOR BOTH APPLE AND THE S&P 500.

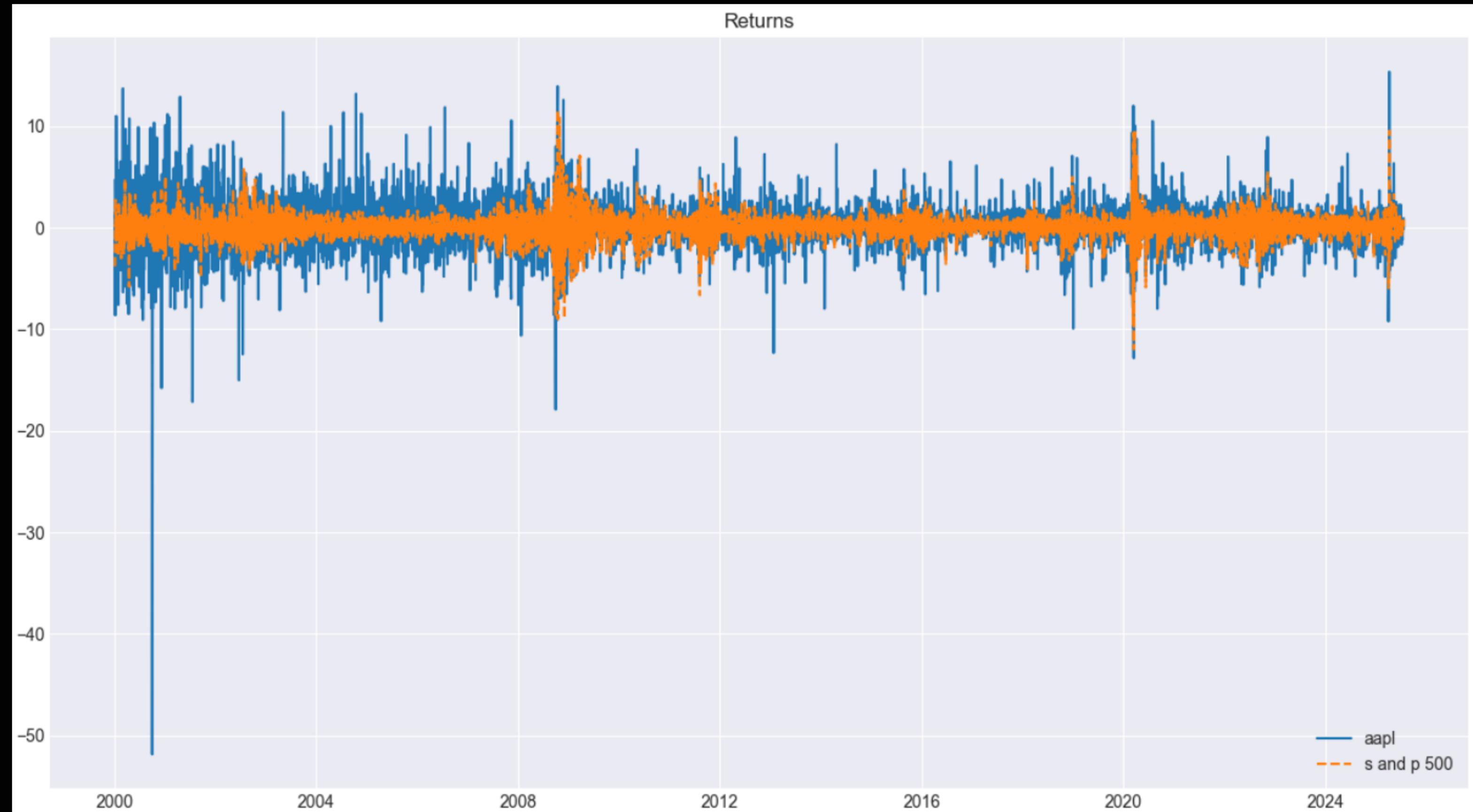
IN FINANCE, RETURN REFERS TO THE GAIN OR LOSS MADE ON AN INVESTMENT OVER A SPECIFIC PERIOD, TYPICALLY EXPRESSED AS A PERCENTAGE. IT REFLECTS HOW MUCH AN INVESTOR EARNs RELATIVE TO THE INITIAL INVESTMENT.

ANALYZING RETURNS—RATHER THAN JUST PRICE—PROVIDES DEEPER INSIGHTS INTO AN ASSET'S PERFORMANCE, VOLATILITY, AND RISK.

DAILY RETURNS, IN PARTICULAR, HELP US UNDERSTAND SHORT-TERM MARKET MOVEMENTS AND HOW SENSITIVE A STOCK IS TO MARKET EVENTS.

THIS ANALYSIS IS CRUCIAL FOR COMPARING INVESTMENTS ON A RELATIVE BASIS AND FOR EVALUATING HOW CONSISTENTLY AN ASSET GENERATES PROFIT OVER TIME.

```
aapl_historical['Return'] = aapl_historical['Close'].pct_change() * 100  
sandp500_historical['Return'] = sandp500_historical['Close'].pct_change() * 100
```



THE PLOT ABOVE ILLUSTRATES THE DAILY RETURNS OF APPLE AND THE S&P 500 OVER TIME. IT IS EVIDENT THAT **APPLE TENDS TO OFFER HIGHER RETURNS COMPARED TO THE INDEX**, AS SEEN IN THE MORE FREQUENT AND LARGER UPWARD SPIKES.

HOWEVER, THESE HIGHER RETURNS COME WITH A TRADE-OFF — **APPLE'S STOCK IS SIGNIFICANTLY MORE VOLATILE**. THE DAILY RETURNS FLUCTUATE MORE WIDELY, WITH SHARP RISES AND STEEP DROPS, ESPECIALLY DURING MARKET EVENTS LIKE THE 2008 FINANCIAL CRISIS AND THE 2020 COVID-19 CRASH.

THIS INDICATES THAT WHILE APPLE HAS THE POTENTIAL FOR GREATER GAINS, IT ALSO CARRIES HIGHER RISK DUE TO ITS PRICE SENSITIVITY AND VARIABILITY.

IN CONTRAST, THE S&P 500 EXHIBITS SMALLER, MORE STABLE MOVEMENTS, REFLECTING THE DIVERSIFIED AND LOWER-RISK NATURE OF THE OVERALL MARKET.

THIS COMPARISON HIGHLIGHTS A CLASSIC RISK-RETURN TRADEOFF: **HIGHER POTENTIAL REWARD USUALLY COMES WITH HIGHER UNCERTAINTY**.

