

# Decoding Stock Returns: The Role of Earnings, Macro, and Sentiment

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## Initial Recommendation Pitch

Prepared and Presented by

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# Analysis Objective

## Objectives of the Analysis:

- Earnings Surprise as a predictor of Post Announcement returns
- Impact of Key Financial Metrics on Stock Performance
- Macroeconomic Influence on Earnings and Stock Prices
- Role of News Sentiment in Market Reactions

## Data Sources:

### Stock Market Data

- Source : Yahoo Finance (YFinance API)
- Metrics: Open, High, Low, Volume, Close (OHLCV)
- Time period : 2000-2024

### Financial Metrics

- Source : Financial Modelling Prep (FMP API)
- Metrics: Earnings, Revenue, Key Financial Ratios
- Time period : 2000-2024

### Macro-Economic Indicators

- Source : Federal Reserve Economic Data (FRED API)
- Metrics: Earnings, Revenue, Key Financial Ratios
- Time period : 2000-2024

### Sentiment Analysis

- Source : NY Times News Articles data provided by VP Analytics
- Time period : 2019-2024

# Earnings Announcement – Event Study

**Objective:** To evaluate whether earnings surprises provide predictive insights into price movements after earnings announcements

**Approach:** To examine the relationship over different post-announcement windows, both for individual tickers and in aggregate

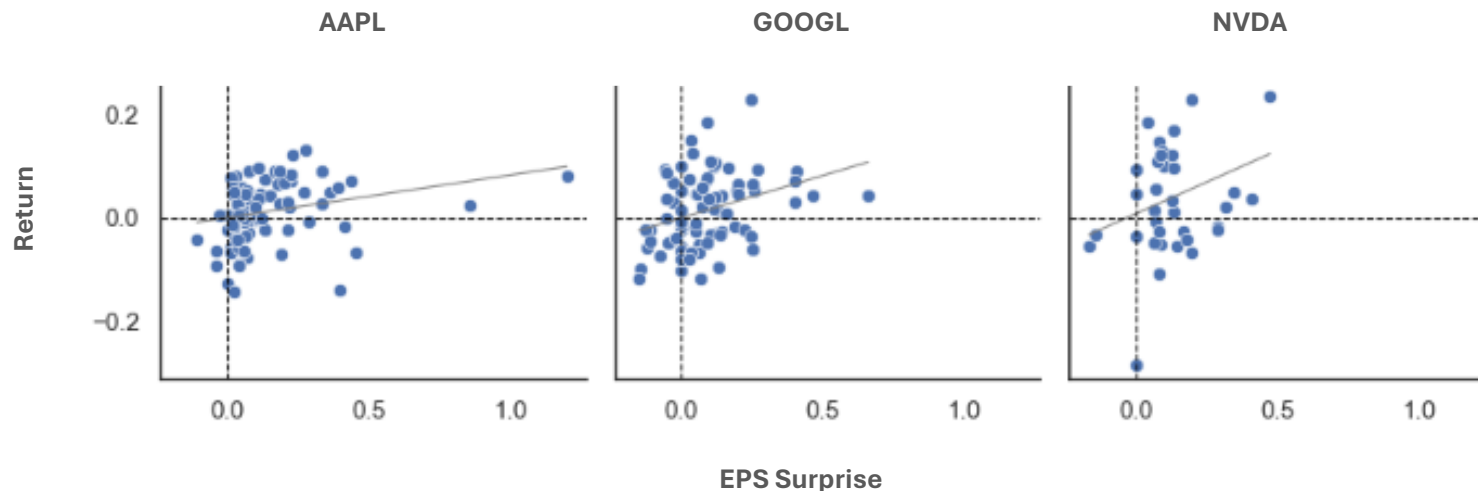
Raw data:

- Source: Earnings Surprises Free Stock Market API
- Period covered: 2000 - 2024

Pre-processing:

- Extreme outliers
- Negative and small Net Profit Margins ( $< 5\%$ )

Relationship Between EPS Surprise and post-announcement Return by ticker (2000 - 2024)

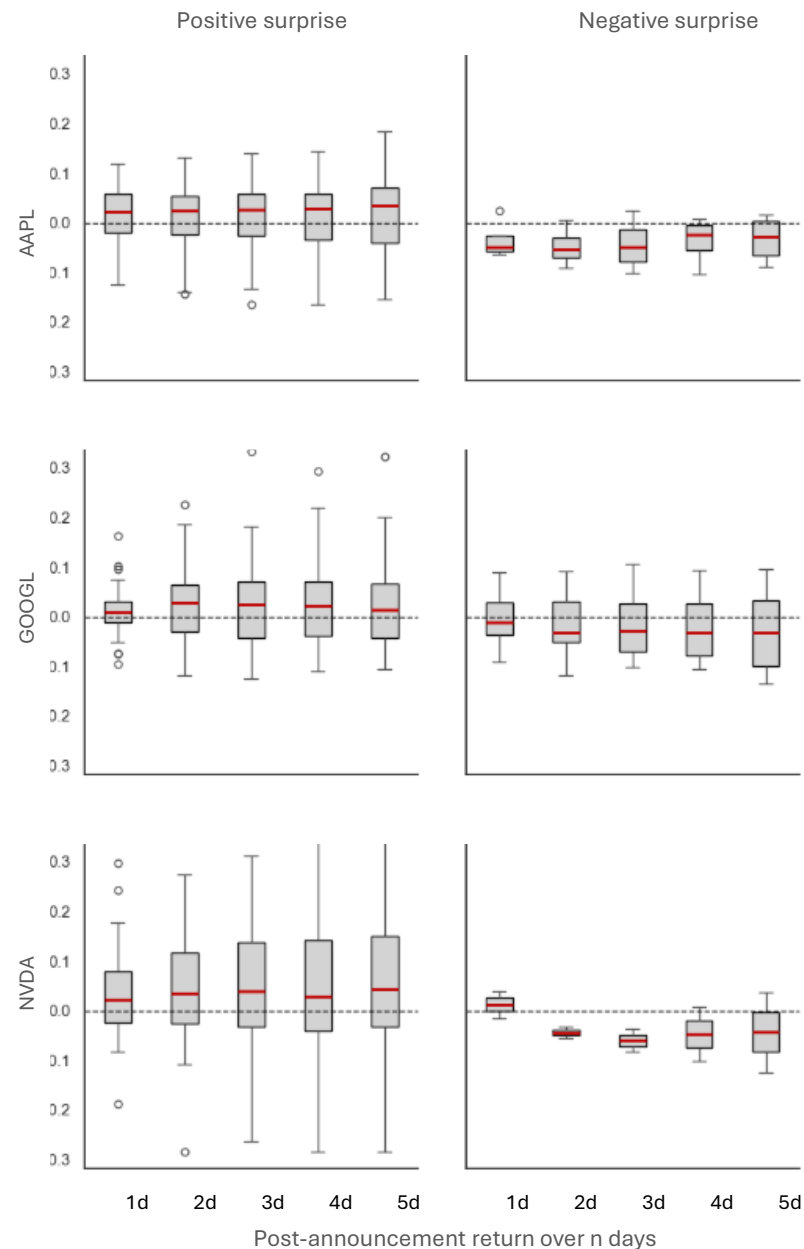


## Initial observations:

1. Most EPS surprises are positive.
2. Post-earnings announcement returns generally align with the direction of the EPS surprise.

# Earnings Announcement – Event Study

Distribution of post-announcement cumulative returns



Pearson correlation analysis: EPS surprise vs. 2-day post-announcement equity return (2000 - 2024)

	AAPL	GOOGL	NVDA	All Symbols
epsSurprise_pct	0.26	0.33	0.29	0.27
standEpsSurpriseScore	0.21	0.37	0.16	0.23
epsSurpriseChange_QoQ	0.19	0.35	0.36	0.27
epsAct_YoY	0.02	0.34	0.05	0.18
revSurprise_pct	0.18	0.24	0.16	0.21
standRevSurpriseScore	0.20	0.20	-0.01	0.15
revSurpriseChange_QoQ	0.08	0.06	0.34	0.11
revenueAct_YoY	0.01	0.21	0.09	0.11
returnPre_5d	-0.02	-0.10	-0.09	-0.07
returnPre_15d	0.01	0.07	-0.13	0.00
returnPre_10d	-0.06	-0.05	-0.10	-0.05
doseCV_5d	0.03	0.24	-0.18	0.07
doseCV_15d	-0.19	0.15	-0.25	-0.03
doseCV_10d	-0.13	0.09	-0.25	-0.06
BOP_SMA_5d	-0.04	-0.11	-0.10	-0.08
BOP_SMA_15d	0.17	-0.02	-0.11	0.05
BOP_SMA_10d	0.01	-0.04	-0.21	-0.05

Derived features:

- EPS Surprise Percentage
- Standardised EPS Surprise Score
- QoQ Change in EPS Surprise
- Pre-Earnings Return / ROC
- Coefficient of Variation of Closing Prices

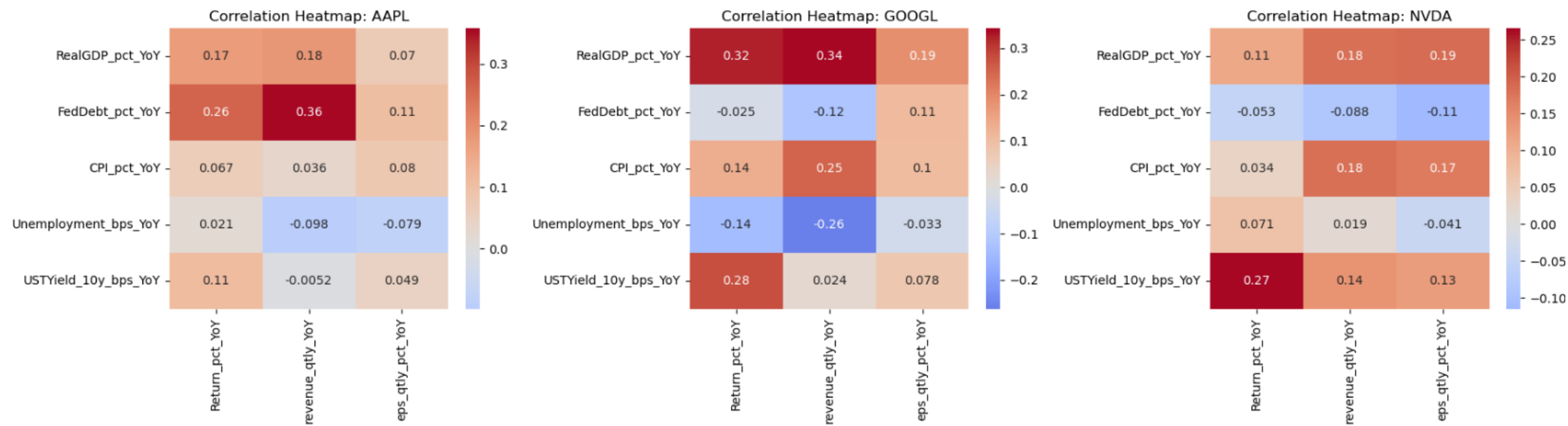
Observations:

1. Post-earnings announcement returns generally follow the direction of the EPS surprise
2. In most cases, the strongest market reaction to EPS surprises occurs within 2–3 days after the announcement, after which returns tend to flatten or reverse
3. While median returns align with expectations, the distribution analysis reveals wide variability, with the first quartile often below zero for positive surprises
4. Weak positive correlation is observed between EPS surprise and the 2-day return
5. Derived features also show weak correlations with returns and correlated with one another

# Macro Economic Indicators

**Macro Economic Indicators** – GDP, Inflation, Unemployment, federal Debt, US Treasury Yield 10Y

## Correlation Heatmap between Macro indicators and Stock Returns and Earnings

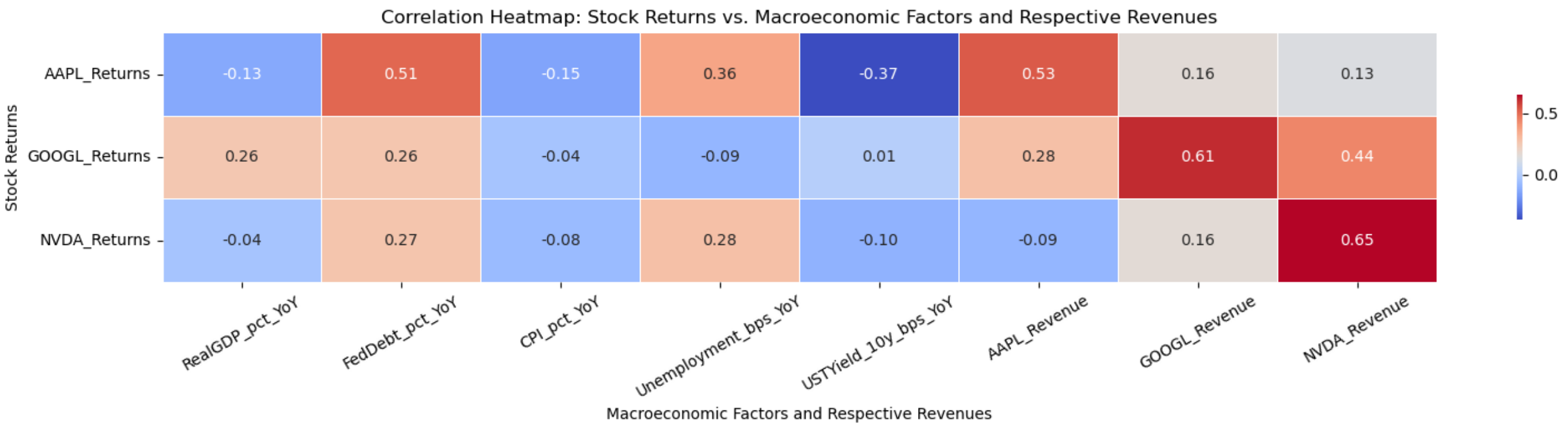


Company	Macro Economic Factor
Apple	Real GDP, Federal Debt
Google	Real GDP, Inflation, UST Yield 10Y
Nvidia	Real GDP, Inflation, UST Yield 10Y

# Macro Economic Indicators

**Macro Economic Indicators considered:** GDP, Inflation, Unemployment, federal Debt, US Treasury Yield 10Y  
**Analysis Time Period:** 2000 - 2024

## Correlation Heatmap between Macro indicators, Revenue to Stock Returns



Company	Macro Economic Factor
Apple	Federal Debt, Real GDP, UST Yield 10y
Google	Federal Debt, Real GDP
Nvidia	Unemployment, Federal Debt

# News Sentiment Analysis Framework

## Dataset Overview:

- NY Times Articles : 1574 (provided by Vantage Data)
- Time period: 2019 – 2024
- Post-Initial Cleanup : 1423 Articles [151 removed]

## Article Classification Workflow:

### Keywords (Metadata)

Organizations (Top 3 Rank)		Subjects (Top 3 Rank)	
Company		Market	
Company	Definition (Examples)	Market	Definition (Examples)
Apple	Apple Inc, Apple TV	Tech-AI	AI, ChatGPT, Perplexity, OpenAI Labs, CAIS, Mistral AI
Google	Google Inc, Alphabet, Youtube, Fitbit	Tech-Macro	Cloud, Data Center, Chips, MSFT, Intel, SVB, Crowdstrike, Outages
NVIDIA	NVIDIA Corporation	Market-Macro	COVID, Elections, war, Govt departments, Tax law
Other	All other organization values	Other	All other items
Combined values	Apple & Google, Apple & NVIDIA etc.	Combined values	Tech AI and Tech Macro, Tech and Market Macro

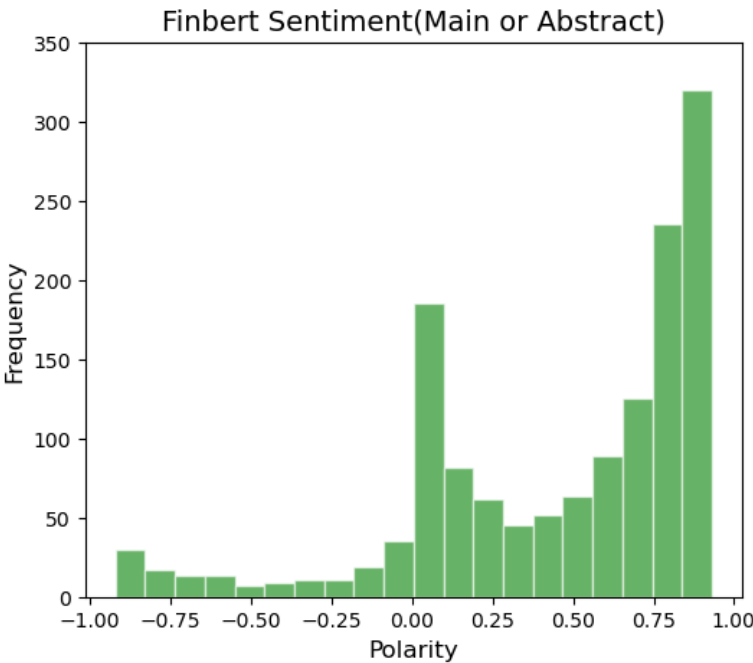
## Sentiment Scoring:

- Abstract, Main (extracted from metadata) and Lead Paragraph considered for analysis.
- ProsusAI’s FinBERT and TextBlob utilized for sentiment evaluation
- Multiple composite scores evaluated and finalized on:

$$\text{Sentiment Score}(\text{Article}) = F(\text{Main}) \text{ or } F(\text{Abstract})$$

$$* F(\text{Text}) = \text{Finbert}_{\text{positive}} - \text{Finbert}_{\text{negative}}$$

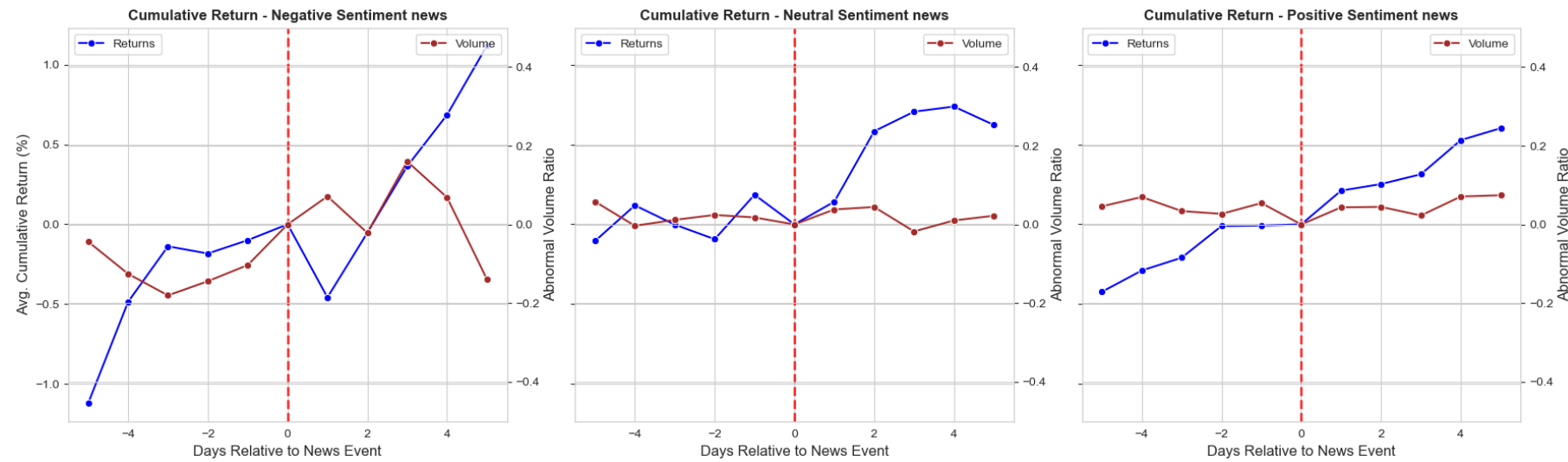
## Sentiment Distribution:



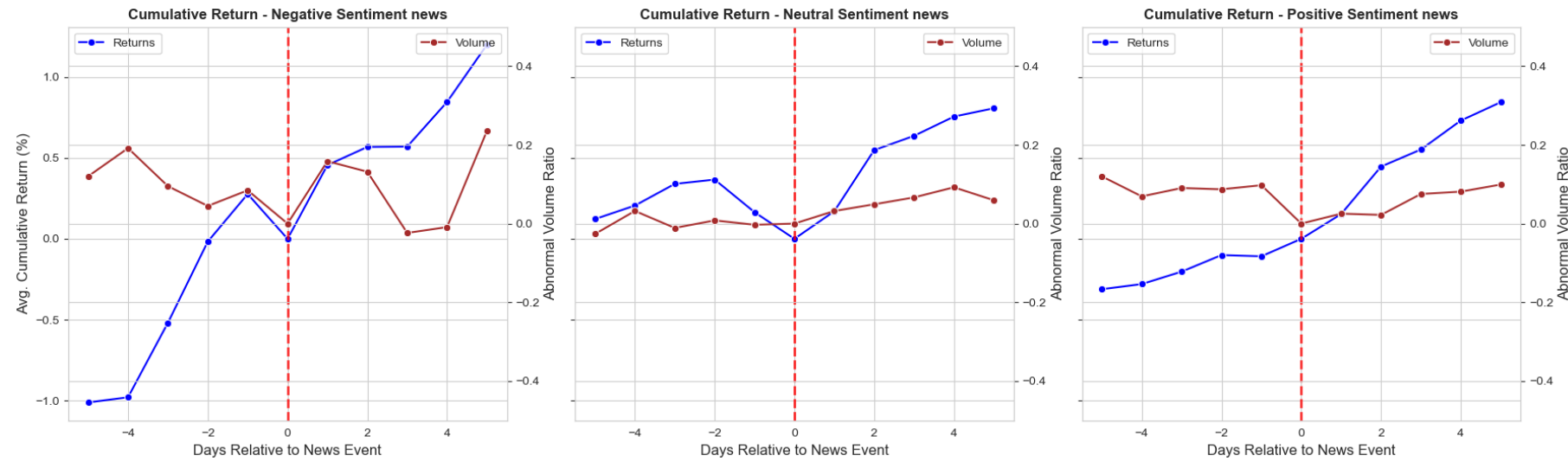
# News Sentiment Analysis – Event Study

## Event Study – What role does news sentiment play in stock price movements?

Event Study: Avg Cumulative Returns by Stock news sentiment (AAPL)



Event Study: Avg Cumulative Returns by Macro news sentiment (AAPL)



### Analysis Methodology:

- Average stock returns and volume behaviour for a 5-day pre/post window around news items classified as positive, negative and neutral plotted.
- Articles related to company were considered for Stock news sentiment (Fig 1), while Articles not related to the company were considered for Macro news sentiment (Fig 2).

### Apple Analysis:

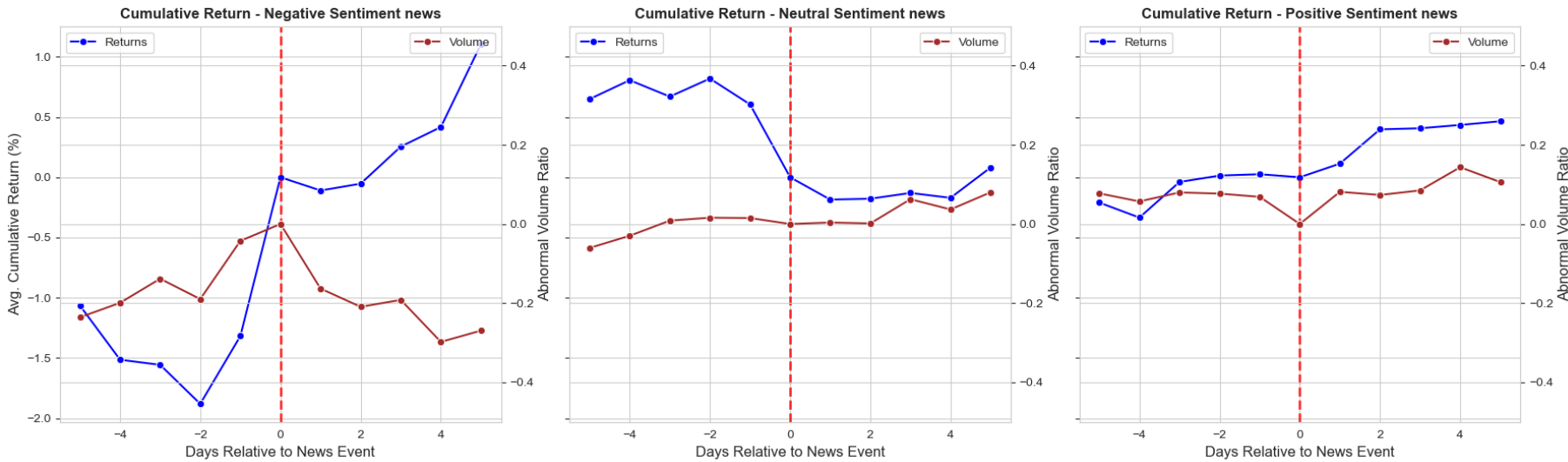
1. Negative news causes a dip (~0.5%) 1 day post article, but gains back by Day 3.
2. Overall, consistently positive drift for neutral and positive news. (~1% in 5 days)
3. Negative Macro news causes ~0.5% dip, is otherwise resilient and stable.



# News Sentiment Analysis – Event Study

## Event Study – What role does news sentiment play in stock price movements?

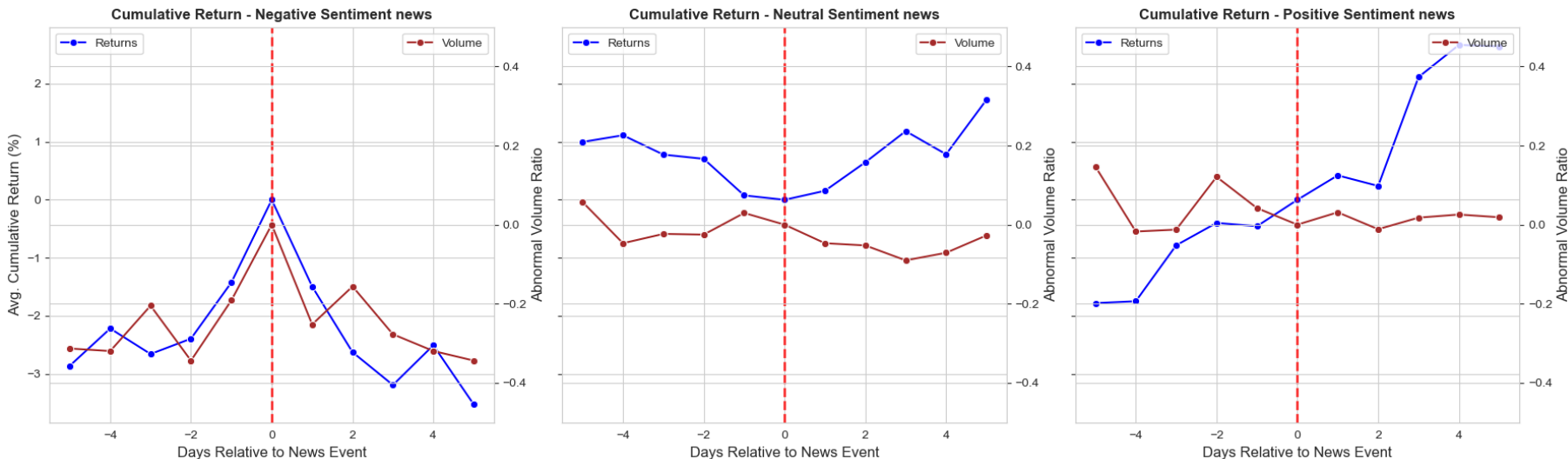
Event Study: Avg Cumulative Returns by Stock news sentiment (GOOGL)



### Google Analysis:

1. Negative news effect is less and is overall most stable among the 3 stocks to sentiment.
2. Return fluctuations stable – within 1% window for Neutral and Positive news.
3. Negative Macro news(not shown here) improves returns, perceived as safe-haven asset.

Event Study: Avg Cumulative Returns by Stock news sentiment (NVDA)

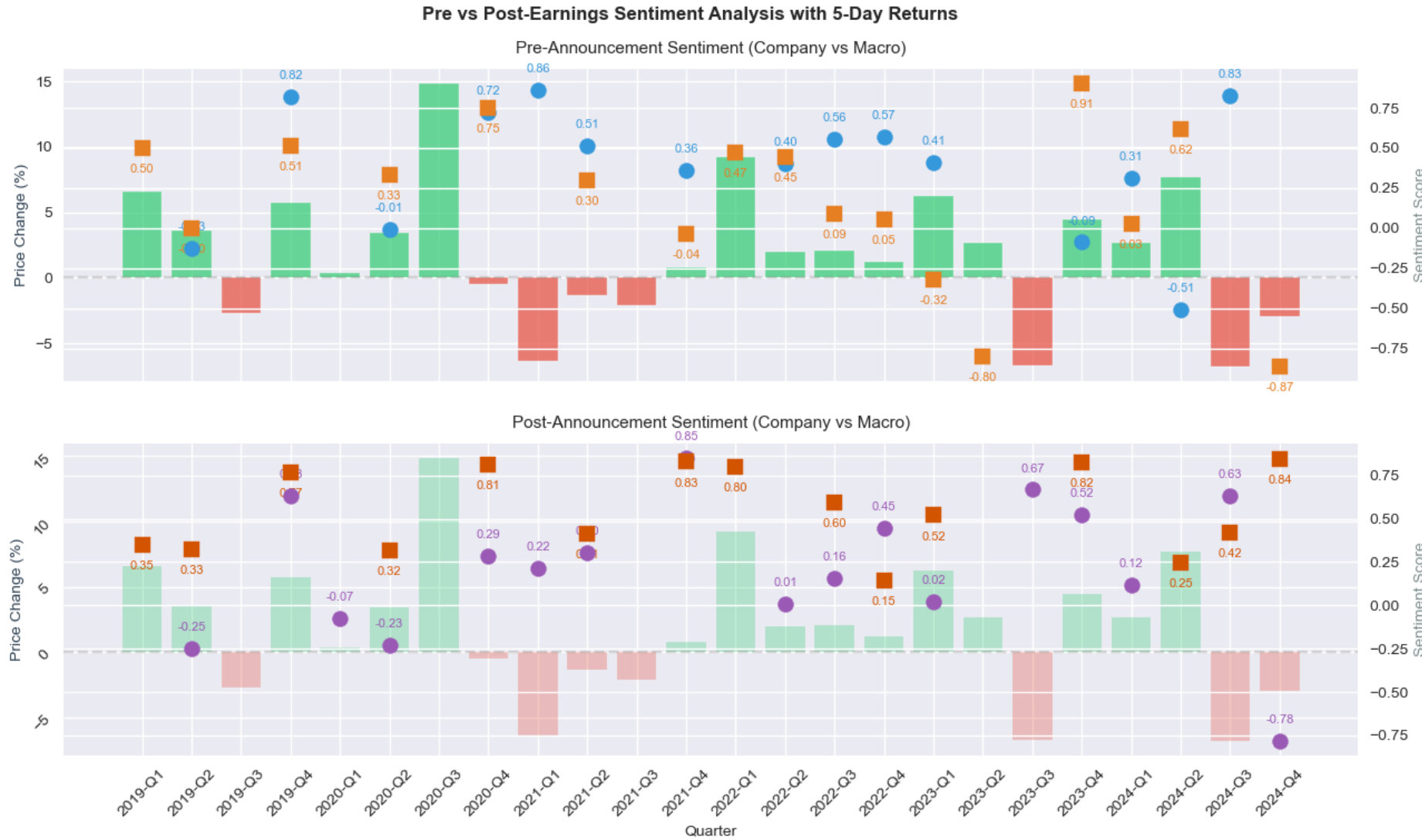


### NVIDIA Analysis:

1. Most sensitive to News Sentiment (Positive and Negative).
2. Sentiment effect seen on Event to Event+2 days.
3. Returns fluctuating at a high level compared to other stocks (+2%-3%)
4. Strong positives on negative macro news (~2% over 4 days)

# Earnings Announcement Event Study and Sentiment Effect

## Apple : Stock Returns behaviour around earnings returns with Company and Macro sentiment plotted



### Pre-Announcement Sentiment Trends:

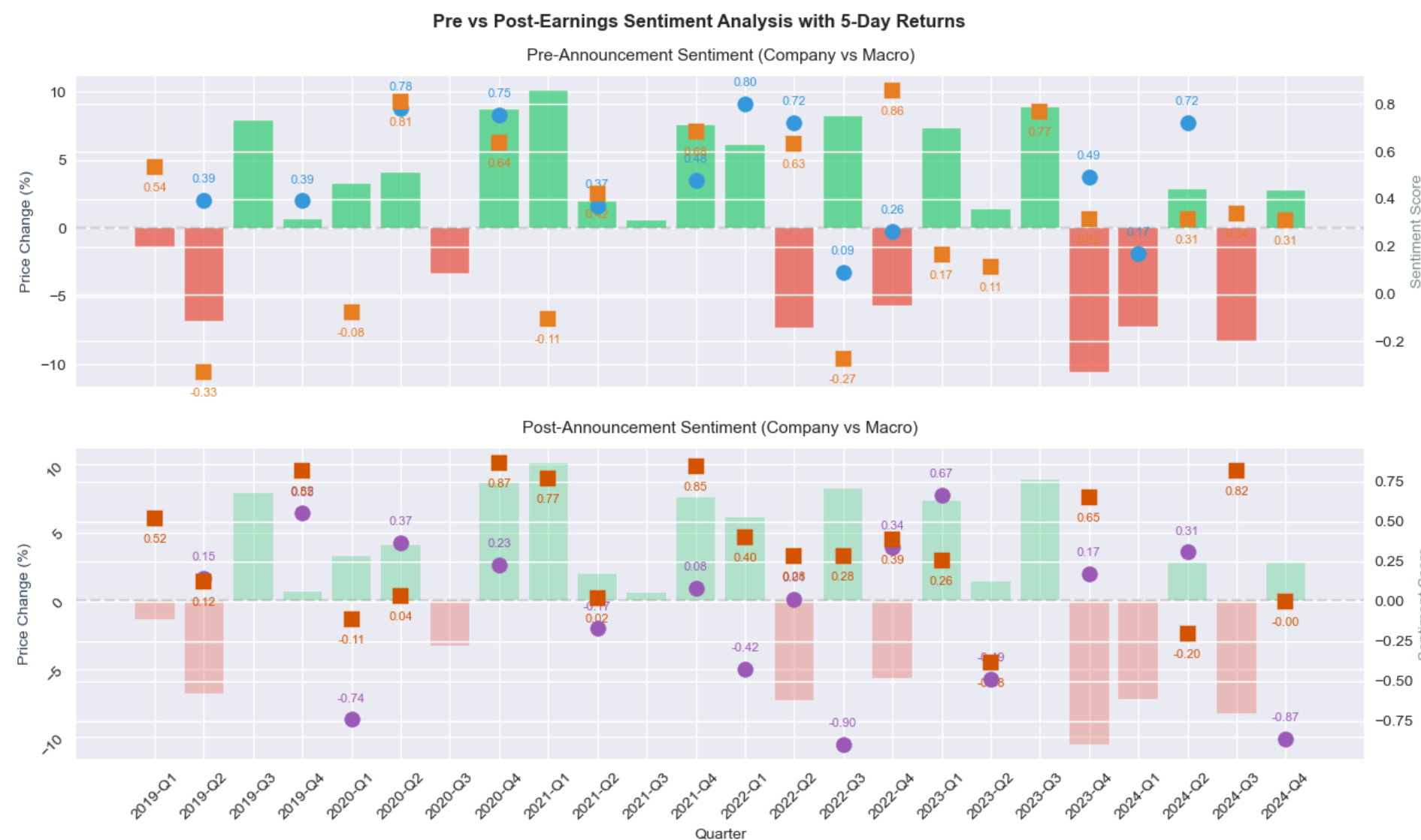
- Company Sentiment (dots) around earnings period was not available for all quarters. 9/20 quarters shown here are missing company sentiment factors. Q3 (4 of 6), Q1 (3 of 6).
- Company and Macro Sentiment are mostly in the same trajectory, macro sentiment is more muted than Company.
- Pre-earnings company sentiment (blue dots) tends to be optimistically biased and it is very rare to see negative pre-earnings sentiment.
- High pre-earnings sentiment doesn't reliably predict positive returns

### Post-Announcement Sentiment Trends:

- Company Sentiment (dots) 5 days post earnings announcement is mostly seen to go down compared to pre-earnings sentiment.
- This reinforces the optimistic bias seen in the pre-earnings sentiments.

# Earnings Announcement Event Study and Sentiment Effect

## Google : Stock Returns behaviour around earnings returns with Company and Macro sentiment plotted



### Pre-Announcement Sentiment Trends:

- Company Sentiment (blue dots) is generally positive (0.3-0.8), showing optimistic pre-earnings expectations.
- Macro Sentiment (orange squares) largely follows company sentiment but with some notable divergences, (2019-Q2 and 2021-Q4)
- There's a consistent pattern of relatively high pre-earnings company sentiment, particularly strong in late 2020 through 2021 (around 0.75-0.80)
- The data appears complete with no missing quarters, unlike Apple.

### Post-Announcement Sentiment Trends:

- Company Sentiment (purple dots) shows a clear pattern of declining after earnings announcements, with some dramatic drops (e.g., 2022-Q2)
- The magnitude of post-earnings sentiment decline varies significantly quarter to quarter
- Several instances of sharp negative sentiment after earnings (below -0.50) suggest Google often disappoints relative to pre-earnings expectations.

# Recommendations

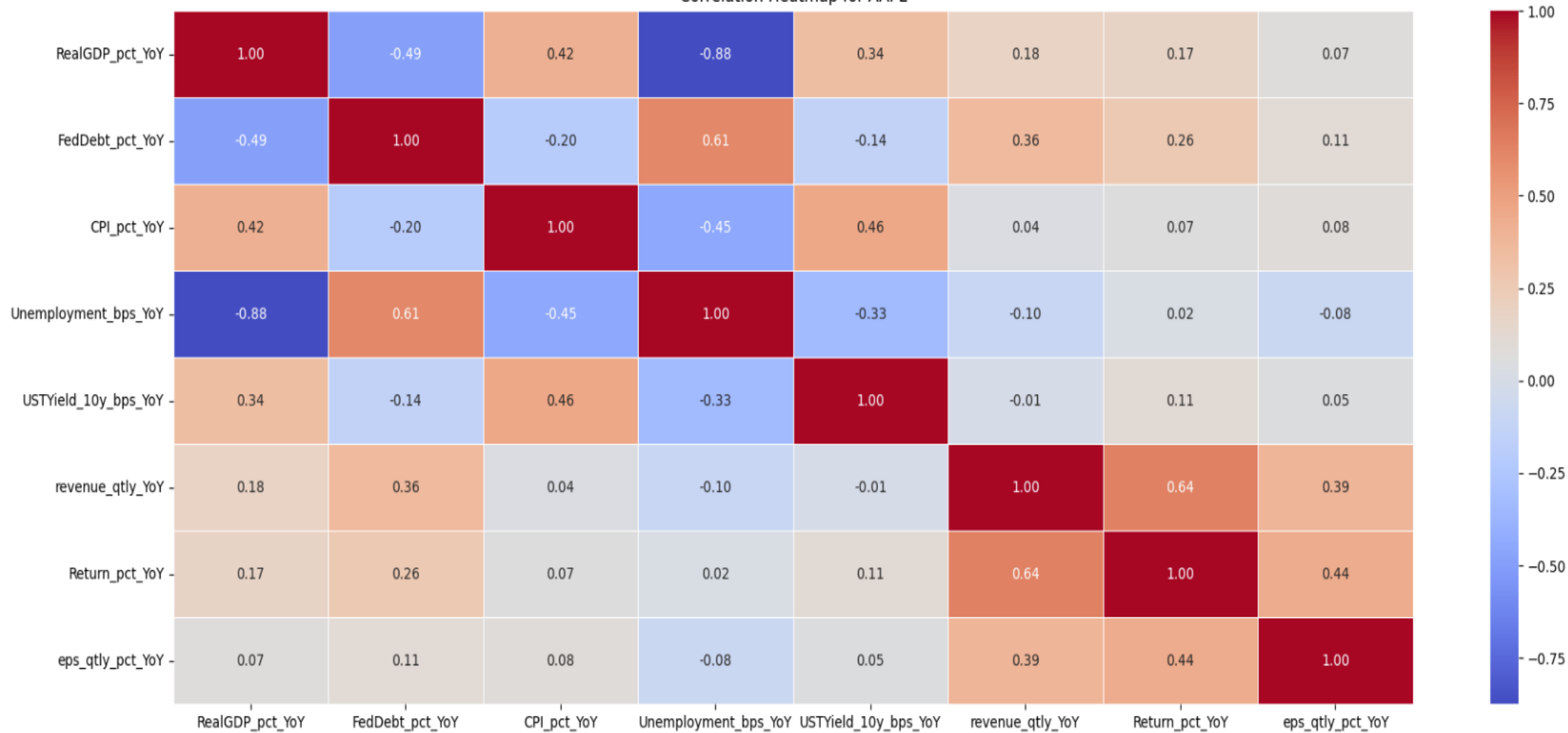
## Recommendations:

- Data indicates NVIDIA is more volatile compared to Google and Apple across all 3 analysis.
  - Investments in NVIDIA should include other risk mitigation factors
  - Use options strategies to capitalize on higher volatility
- Apple is more resilient compared to Google based on market, macro and sentiment factors.
- Revenue is the biggest driver for returns across all 3 companies, macro-economic factors have a minor significance to the returns of these companies.
- Long Term – YoY returns show a correlation with YoY revenue growth rates. Based on this relationship, we recommend analysing expected revenue growth rates from a fundamental perspective and prioritising investments in companies with the highest projected revenue growth.
- Short Term – on Earnings Announcement and News Events, 2 to 3 days pre-post the earnings announcement event is the ideal trading window with higher volatility (+/- 1% for Apple and Google, +/-2% for NVIDIA)
- Risk-Reward is to be analysed before implementing the short-term strategy.

# Macro Economic Indicators – Appendix 1 [Apple]

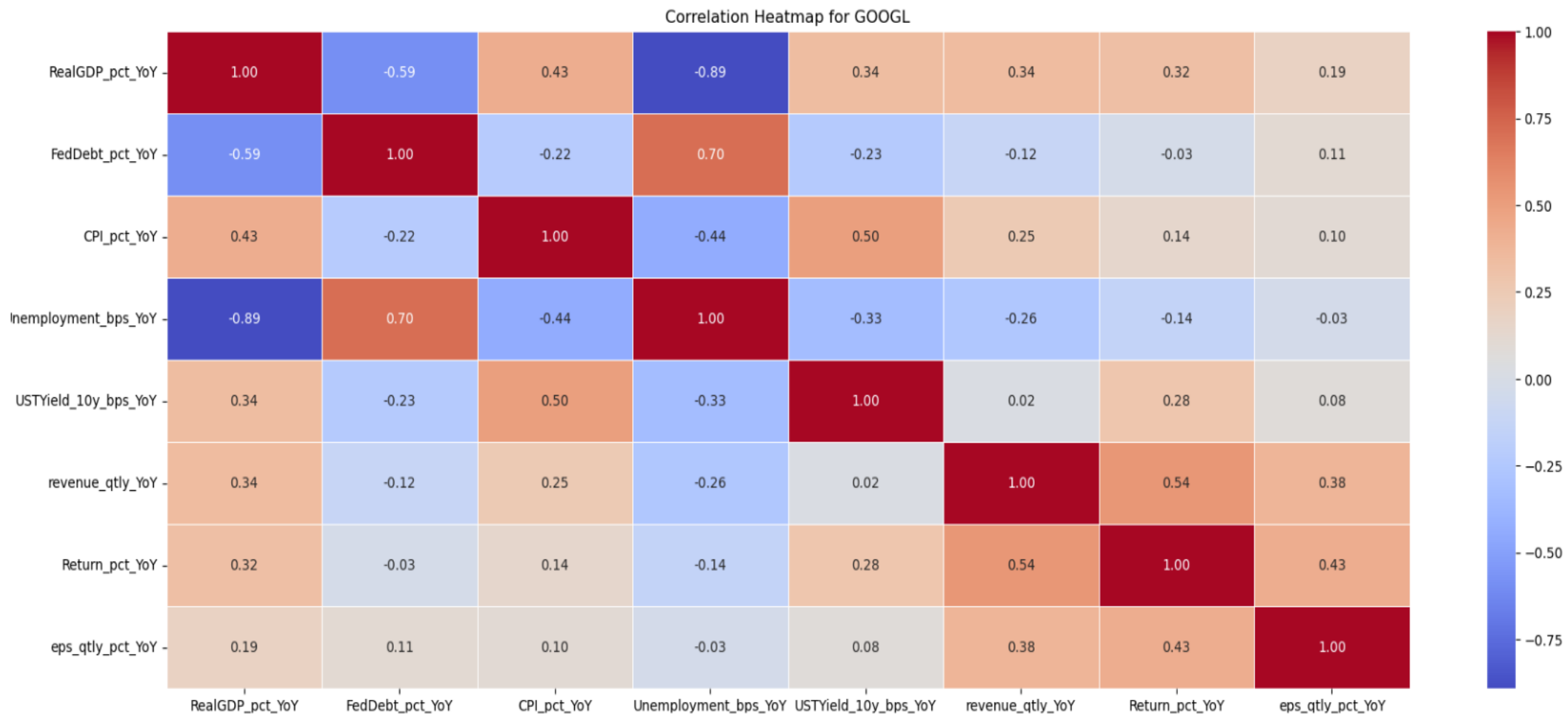
AAPL

Correlation Heatmap for AAPL



# Macro Economic Indicators – Appendix 2 [Google]

GOOGL



# Macro Economic Indicators – Appendix 3 [NVIDIA]

NVDA

