Summary of NVIDIA Returns Analysis

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NVIDIA Wiki: https://en.wikipedia.org/wiki/Nvidia

NVIDIA Earnings Analysis Dashboard: https://nvidiaearningsanalysis.streamlit.app/

GitHub Repo (all source code): https://github.com/NawazPasha26/NvidiaEarningsDashboard.git

Objective

- The dashboard analyzes NVIDIA's performance around quarterly earnings announcements over a 3-year period (Sep 30, 2022 - Sep 30, 2025). It decomposes daily returns into systematic (factor-based) and idiosyncratic (company-specific) components, evaluates volatility changes, and test's statistical reliability.

Approach

Data Inputs

- NVIDIA daily returns from Oct 2022 to Sep 2025.
- Factor returns & loadings (Market, Momentum, Quality, Semiconductors, etc.).
- Earnings dates (after-market releases; reaction measured on next trading day).

Return Decomposition

- Factor-Predicted Return = ∑(beta × factor retum).
- Idiosyncratic Return = NVDA actual return - factor-predicted return.
- Cumulative returns computed for NVIDIA and components.

Event Study Design

- Configurable event window (±5-20 days).
- Align returns around earnings day (day 0 = first trading day post-announcement).
- Compute average returns and absolute move sizes pre-event, during, and post-event.

Volatility Analysis

- Rolling volatility (annualized) for NVIDIA and idiosyncratic component.
- Compare pre vs post earnings volatility per event.

Statistical Tests

- t-tests for:
- Event-day mean return ≠ 0 (Total & Idiosyncratic).
- " Pre vs post volatility change.
- * Report p-values for reliability.

Visualization

- Interactive Streamlit dashboard with:
- Time-series charts (returns, volatility).
- Event-aligned averages & cumulative returns.
- Boxplots (earnings vs non-earnings days).
- Correlation heatmaps for factor returns.
- Top 5 factors by contribution.

Key Insights

Performance Around Earnings

- Day 0 reaction dominates: NVIDIA's first trading day post-earnings shows the largest move, often much larger than pre-event daily swings.
- Idiosyncratic component drives earnings-day moves: Typically, >70% of day-0 move is company-specific, not explained by market/sector factors.
- Pre-event drift: Average returns before earnings are modest, suggesung limited pre-announcement leakage.

Factor vs Idiosyncratic Influence

- On normal days, factor-driven moves are meaningful (median absolute factor move $\approx$ 0.3-0.4%), but idiosyncratic moves dominate earnings reactions.
- R^2 and correlation metrics vary by period; higher R^2 implies factor relevance, R^2 signals stock-specific risk.

Volatility Patterns

- Volatility spikes on day 0, then typically declines post-earnings as uncertainty clears.
- About 60-70% of events show lower volatility after earnings, but some "heat up" (post > pre).

Statistical Reliability

- Event-day returns are significantly different from zero ($p < 0.05$ in most cases).
- Volatility changes post-earnings are less consistently significant; results depend on sample size and window length.

Limitations

- Few events $\rightarrow$ Limited statistical power.
- Model sensitivity: Factor set and rolling window choices affect decomposition.
- Non-normal returns: t-tests approximate; interpret cautiously.
- After-hours timing: Day 0 mixes pre/post-market moves.

Practical Takeaways

- Risk Management: Reduce exposure or hedge before earnings to avoid surprises.
- Hedging Strategy: Use ETFs/futures for market/sector risk if factor influence is high.
- Post-Earnings Play: Decide to follow or fade day-0 move based on fundamentals.