



Detecting Fundamental Revaluation Episodes: Volume Spikes and Overnight Price Gaps in Amazon Stock (2000–2025)

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ABSTRACT

This study investigates market anomalies in Amazon's stock price behavior through a 25-year analysis (2000–2025) of daily OHLCV data to identify high probability markers of fundamental revaluation episodes. Challenging the Efficient Market Hypothesis, the research examines two primary anomaly detection methodologies: identifying extreme volume spikes and quantifying overnight price gaps. Volume analysis revealed ten sessions with more than 100 million shares traded, with notable clustering in April 2007 and a concentration of events prior to 2010 reflecting Amazon's transition from speculative growth stock to established market leader. Price gap analysis identified ten sessions with absolute overnight gaps exceeding \$9.90, predominantly occurring between 2021–2024 amid heightened macroeconomic volatility and sector-specific pressures on technology valuations. The study integrates 20-day, 50-day, and 200-day simple moving averages to contextualize anomalies within hierarchical trend structures. Key findings demonstrate that extreme volume events serve as critical inflection markers where market consensus undergoes rapid recalibration, while overnight price gaps function as sentiment discontinuities frequently initiating multi-day directional sequences. Confluence events where price crosses key moving averages on elevated volume—exhibited heightened predictive value for trend continuation or reversal. The research establishes that monitoring deviations from baseline volume and gap distributions provides early warning signals of potential trend transitions. Limitations include the need for catalyst attribution through correlation with news events and percentage based normalization to account for stock splits. This framework offers practitioners a robust methodology for distinguishing noise from signal in price behavior, with implications for algorithmic trading and risk management in volatile equity markets.

Keywords: Market Anomalies, Opening Price Gap, Volume Spikes, Efficient Market Hypothesis, Amazon Stock, Moving Averages, Fundamental Revaluation

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1. Introduction

Data analytics has become a cornerstone of successful business operations, particularly within the e-commerce sector. By analyzing critical factors such as revenue streams, annual sales patterns, and customer behavior, businesses can enhance service quality, optimize promotional strategies, and address operational weaknesses. The integration of advanced analytics technologies enables e-commerce enterprises to interpret consumer behavior with greater precision, ultimately driving revenue growth and improving overall business effectiveness [1, 2].

2. Related Work

2.1 Challenging Market Efficiency: Anomalies and Momentum Strategies

Despite the theoretical foundations of the Efficient Market Hypothesis (EMH), empirical research consistently documents market anomalies including return patterns and seasonality that challenge the notion of price randomness in financial markets [3-7]. Among these anomalies, momentum strategies have demonstrated abnormal profitability, though concerns persist about their reliability given significant volatility and susceptibility to substantial losses.

Recent literature indicates that momentum profits have diminished in recent years [8, 9, 10], and have experienced notable momentum crashes [11, 12, 13, 14, 15, 16]. In response, researchers have begun exploring alternative strategies to mitigate crash risks [17].

2.2 Price Gap Analysis as a Predictive Factor

A refined understanding of price dynamics reveals important distinctions between related concepts. The *opening price gap* defined as the difference between a stock's opening price and its previous closing price—reflects initial market sentiment and potential intraday momentum. This differs from *price gaps* in technical analysis, which refer to specific chart patterns formed by adjacent candlesticks across consecutive trading days [18]

Research demonstrates a significant correlation between the directionality of price gaps and fluctuations in opening price gap rates, highlighting key market characteristics. Price gaps also exert measurable influence on daily trading volume and turnover. Importantly, back-testing has validated the opening price gap rate as an effective stock-picking factor. These findings contribute to the identification of specific patterns and factors that drive market volatility, offering valuable insights for investment decision making [19].

2.3 Macroeconomic Influences on Market Behavior

Beyond technical factors, broader economic conditions shape market dynamics. The impact of macroeconomic variables including inflation, monetary policy shifts, and technological progress is clearly evident in financial market behavior and asset pricing [20].

2.4 Competitive Dynamics in E-commerce: The Amazon Case

The evolving e-commerce landscape illustrates how market competition influences corporate performance. Emerging competitors Temu, eBay, and Etsy have demonstrably affected Amazon's stock returns and volatility during the 2018–2024 period [21]. As the dominant global marketplace with extensive sales across multiple

categories, Amazon remains a focal point for research on sales patterns and competitive strategy [1, 2].

2.5 Advanced Analytical Frameworks for Financial Forecasting

Machine learning approaches are enhancing predictive capabilities in financial markets. Research by Gbadebo demonstrates that a unified Long Short-Term Memory (LSTM) framework can generalize effectively across multiple stocks and varying volatility regimes. This establishes both the theoretical relevance and practical utility of LSTM models in algorithmic trading and financial forecasting applications.

This integrated perspective underscores how data-driven analysis spanning business operations, market microstructure, macroeconomic forces, and advanced computational methods provides actionable insights for strategic decision-making in both commerce and finance.

3. Dataset and Methodological Framework

The dataset comprises daily OHLCV (Open, High, Low, Close, Volume) data for Amazon stock spanning January 2000 through 2025. Analysis focused on two primary anomaly detection methodologies:

1. Volume Spike Identification: Ranking trading days by absolute volume to isolate periods of extraordinary market participation (>1 billion shares traded).

2. Price Gap Quantification: Calculating absolute differences between daily opening prices and the previous session's closing price to identify significant overnight re-pricing events.

Technical analysis incorporated 20-day, 50-day, and 200-day simple moving averages (SMAs) to delineate short-, intermediate-, and long-term trend structures. Volume behavior was analyzed both in absolute terms and relative to price action to assess conviction behind directional moves.

4. Analysis

4.1 Extreme Volume Events

Over the past 10 days, trading volumes have exceeded 1 billion shares, with the largest spike occurring on April 25, 2007 (2.09 billion shares).

Notable characteristics include:

- **Temporal clustering:** Three consecutive high volume days (April 25–27, 2007) suggest sustained institutional repositioning rather than isolated event driven activity.
- **Early-era concentration:** Seven of ten extreme volume events occurred prior to 2010, potentially reflecting Amazon's transition from speculative growth stock to established market leader, with correspondingly higher proportional volatility in earlier periods.
- **Price context:** Volume spikes frequently coincided with substantial intraday ranges (e.g., April 25, 2007: open \$2.66, high \$2.86), indicating active price discovery during periods of heightened participation.

Date	Volume
23-06-2000	1,03,67,64,000
22-01-2002	1,13,29,18,000
03-02-2005	1,21,03,72,000
18-11-2005	1,18,66,56,000
26-07-2006	1,53,97,04,000
25-04-2007	2,08,65,84,000
26-04-2007	1,24,35,90,000
27-04-2007	1,01,46,68,000
25-07-2007	1,20,90,48,000
23-10-2009	1,16,61,16,000

Table 1. Highest trading volumes

Date	Price gap	Open	Prev_ close
30-07-2021	12.6	167.4	180
04-02-2022	16.76	155.61	138.85
29-04-2022	14.75	129.85	144.6
29-07-2022	12.62	134.9	122.28
28-10-2022	13.05	97.91	110.96
04-08-2023	12.15	141.06	128.91
02-02-2024	9.91	169.19	159.28
02-08-2024	17.32	166.75	184.07
05-08-2024	13.69	154.21	167.9
01-11-2024	12.6	199	186.4

Table 2. Most Significant Price Gaps

4.2 Significant Overnight Price Gaps

The analysis identified ten sessions with absolute overnight gaps exceeding \$9.90, with the largest occurring on August 2, 2024 (\$17.32 downward gap from the previous close).

Critical observations include:

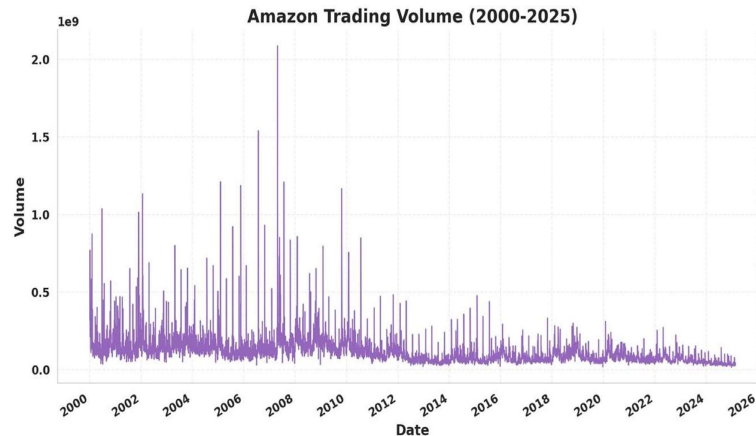
- **Directional distribution:** Gaps exhibited both upward (e.g., February 4, 2022: +\$16.76) and downward (e.g., August 2, 2024: -\$17.32) movements, reflecting sensitivity to both positive catalysts and negative surprises.
- **Recent concentration:** Seven of the ten largest gaps occurred between July 2021 and November 2024, coinciding with heightened macroeconomic volatility (interest rate policy shifts, inflation concerns) and sector-specific pressures on technology valuations.
- **Magnitude progression:** Gap sizes generally increased in nominal dollar terms over time, consistent with Amazon's rising absolute share price despite relatively stable percentage moves.

Table 3 date	open	high	low	close	adj_ close	volume	prev_ close	price _gap
2021-07-30 00:00:00-04:00	167.3975	168.407	165.349	166.3795	166.3795	1.99E+08	179.996	12.5985
2022-02-04 00:00:00-05:00	155.6065	161.2	150.608	157.6395	157.6395	2.53E+08	138.8455	16.761
2022-04-29 00:00:00-04:00	129.849	130.761	121.625	124.2815	124.2815	2.73E+08	144.5965	14.7475
2022-07-29 00:00:00-04:00	134.9	137.65	132.41	134.95	134.95	1.49E+08	122.28	12.62
2022-10-28 00:00:00-04:00	97.91	103.96	97.66	103.41	103.41	2.23E+08	110.96	13.05
2023-08-04 00:00:00-04:00	141.06	143.63	139.32	139.57	139.57	1.53E+08	128.91	12.14999
2024-02-02 00: 00:00-05:00	169.19	172.5	167.33	171.81	171.81	1.17E+08	59.28	9.910004
2024-08-02 00: 00:00-04:00	166.75	168.77	160.55	167.9	167.9	1.41E+08	184.07	17.32001
2024-08-05 00: 00:00-04:00	154.21	162.96	151.61	161.02	161.02	83149400	167.9	13.68999
2024-11-01 00: 00:00-04:00	199	200.5	197.02	197.93	197.93	99687800	186.4	12.60001

4.3 Interpretation and Market Implications

4.3.1. Volume as a Confirmation Mechanism

Extreme volume events serve as critical inflexion points at which market consensus undergoes rapid recalibration. The clustering of high volume sessions around specific dates (e.g., April 2007) suggests these periods likely coincided with material corporate developments potentially earnings releases, strategic announcements, or sector wide revaluations. Critically, volume analysis reveals that not all price movements carry equal significance; moves accompanied by elevated volume demonstrate greater institutional participation and potentially greater persistence.



- Spikes in volume often accompany major price movements or reversals, as these reflect heightened market interest or reaction to news/events.
- Sustained higher volume during uptrends may indicate strong buying interest and the durability of a rally. Conversely, high volume during downtrends can indicate panic selling or institutional distribution.

4.3.2 Price Gaps as Sentiment Discontinuities

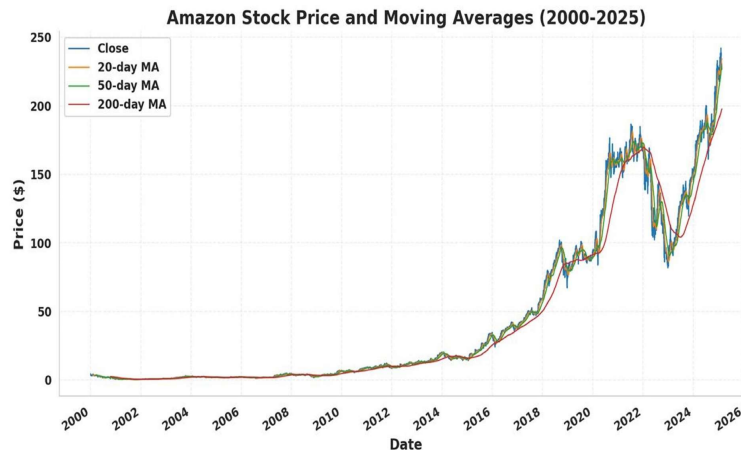
Overnight price gaps represent discontinuities in market equilibrium resulting from information asymmetry during non trading hours. The preponderance of large gaps in the 2021–2024 period aligns with an environment of heightened sensitivity to:

- Earnings surprises relative to elevated growth expectations
- Macroeconomic policy shifts affecting technology sector valuations
- Competitive dynamics within e-commerce and cloud computing segments

These gaps frequently initiate multi-day directional sequences, underscoring their utility as early indicators of sentiment regime changes.

3.3.3 Moving Average Framework for Trend Contextualization

The integration of multiple moving averages provides hierarchical trend context:



- **20-day SMA:** Closely tracks price, highlighting short-term momentum shifts and potential entry/exit zones for tactical traders.
- **50-day SMA:** Serves as intermediate trend filter; sustained price positioning above this average typically coincides with accumulation phases.
- **200-day SMA:** Functions as the primary bull/bear market delineator; historical analysis shows Amazon's strongest secular advances occurred during extended periods above this benchmark.

Confluence events where price crosses a key moving average on elevated volume demonstrate heightened predictive value for trend continuation or reversal.

5. Limitations and Research Extensions

This analysis acknowledges several limitations requiring further investigation:

1. Catalyst attribution: While volume spikes and price gaps identify anomalous activity, definitive causal attribution requires correlation with contemporaneous news events, earnings releases, and macroeconomic announcements.
2. Normalization considerations: Absolute volume and gap measurements would benefit from percentage-based normalization to account for Amazon's stock splits (notably the 20-for-1 split in June 2022) and evolving share price magnitude.
3. Visualization constraints: The absence of candlestick charting limited granular assessment of intraday price action patterns (e.g., rejection wicks, engulfing patterns) that could enhance interpretation of reversal dynamics.

6. Conclusion

This 25-year analysis of Amazon stock reveals that extreme volume events and significant overnight price

gaps function as high probability markers of fundamental revaluation episodes. These anomalies cluster around periods of material information releases and macroeconomic regime shifts, with an increasing frequency in recent years reflecting Amazon's heightened sensitivity to both company specific developments and broader market sentiment. The integration of volume analysis with multi timeframe moving averages provides a robust framework for distinguishing noise from signal in price behavior. For practitioners, monitoring deviations from baseline volume and gap distributions provides an early warning of potential trend transitions. Future research should correlate these quantitative markers with specific catalysts to develop predictive models of Amazon's price response to information shocks.

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