

Optimizing Earnings Surprise Strategies: Addressing Coverage Fluctuations and Enhancing Performance

I. Executive Summary

The quantitative trading portfolio, designed to capitalize on earnings surprises by longing stocks with positive surprises and shorting those with negative earnings shocks, leverages the well-documented Post-Earnings Announcement Drift (PEAD) anomaly. However, the observed sharp increase in portfolio coverage around earnings call periods, followed by a significant decrease, presents a critical operational challenge. This fluctuation indicates that the strategy is primarily capturing immediate, short-lived reactions rather than fully leveraging the extended drift phenomenon. This leads to suboptimal capital deployment, heightened risk exposure during active periods, and missed opportunities for sustained alpha generation. This report delves into the multifaceted problems arising from this inconsistent exposure, including elevated transaction costs, inefficient capital utilization, increased concentration risk, and exacerbated short selling risks. It then proposes a series of strategic enhancements focused on optimizing trade execution and holding periods, refining stock selection through advanced fundamental and technical filtering, establishing robust risk management frameworks, and implementing continuous portfolio management and rebalancing. These recommendations aim to achieve more consistent exposure and superior risk-adjusted returns by aligning the strategy with the true nature of the PEAD anomaly.

II. The Post-Earnings Announcement Drift (PEAD) Anomaly: Foundations and Characteristics

Definition and Historical Persistence of PEAD

Post-Earnings Announcement Drift (PEAD), also known as the Standardized Unexpected Earnings (SUE) effect, is a deeply entrenched phenomenon in financial markets and accounting research. It describes the consistent tendency for a stock's cumulative abnormal

returns to drift in the direction of an earnings surprise for an extended period following an earnings announcement.¹ This implies that if a company reports earnings that exceed expectations, its stock price tends to continue its upward trajectory for a measurable duration. Conversely, if earnings fall short of expectations, the stock price tends to continue its downward drift.

The persistence of this drift is a defining characteristic, often lasting for several weeks to multiple months.¹ Academic research consistently indicates that this effect can persist for at least 60 days¹, and some studies suggest it can extend up to 9 months⁵ or even a full year post-announcement.⁷ First identified by Ball and Brown in 1968, PEAD has gained widespread recognition as one of the most robust and consistently observed anomalies in asset pricing. Its enduring presence has led prominent financial economists, such as Eugene Fama, to characterize it as "an anomaly above suspicion" and "the granddaddy of underreaction events".² The continued existence of PEAD fundamentally challenges the strong form of the efficient market hypothesis, which posits that all new, publicly available information should be immediately and fully incorporated into stock prices, thereby eliminating any opportunities for sustained abnormal returns.²

Behavioral and Market Microstructure Explanations for PEAD

The persistence of PEAD, despite decades of academic scrutiny, is largely attributed to a combination of investor behavioral biases and specific market microstructure characteristics that impede immediate price efficiency.

The most widely accepted explanation for PEAD is that investors underreact to the information embedded in earnings surprises, leading to a delayed price response.¹ This underreaction is often rooted in investors' failure to fully grasp the broader implications of current earnings for a company's future earnings trajectory.¹ Some theoretical frameworks suggest that investors may rely on simplistic forecasting models, such as a "naive seasonal random walk earnings forecasting model," where they expect current earnings to closely mirror those of the same quarter in the previous year.¹ This naive expectation prevents them from fully accounting for the time-series properties of earnings, leading to an initial underreaction. Consequently, the stock price initially adjusts only partially to the surprise, and then slowly drifts as the market gradually processes and incorporates the full informational content over time.⁸

Information asymmetry and delayed disclosure also play a significant role in perpetuating PEAD.¹ Research indicates a clear inverse relationship: higher levels of delayed disclosure (DD) of financial information are associated with a weaker immediate market reaction to earnings surprises but a stronger and more prolonged PEAD.¹ This suggests that even after official regulatory filings, such as the 10-Q, are made public, previously withheld or complex information takes considerable time to be fully digested and reflected in market prices. Complete price correction often does not occur until the subsequent earnings

announcement.¹ This delay in information assimilation increases the perceived arbitrage risk for attentive investors, leading to less aggressive initial trading and, consequently, a greater and more sustained PEAD.¹

Beyond purely rational models of information processing, behavioral finance theories offer compelling insights into PEAD's persistence. Psychological factors such as investor sentiment, herding behavior, overconfidence, confirmation bias, and loss aversion significantly influence how market participants interpret and react to earnings information.⁷ For instance, investors might selectively focus on information that confirms their existing convictions (confirmation bias) or exhibit excessive optimism, leading to an underreaction to negative news. Similarly, biases among financial analysts, such as an inherent upward bias in their forecasts or a tendency towards herding behavior (where analysts are hesitant to deviate significantly from consensus estimates), can further contribute to market inefficiencies and subsequent underreaction.⁷

Finally, practical constraints within financial markets, commonly referred to as "limits-to-arbitrage," prevent immediate and full price adjustment. These include trading frictions, high transaction costs, and limitations on arbitrage capital. These factors make it difficult for sophisticated investors to fully exploit the mispricing without incurring prohibitive costs or taking on excessive risks, thereby allowing the price drift to persist.¹

Key Factors Influencing the Magnitude and Duration of PEAD

The strength and duration of PEAD are not uniform across all market participants or securities. Several key factors influence its magnitude and persistence:

- **Firm Characteristics:** PEAD tends to be more pronounced for firms exhibiting specific attributes:
 - Higher transaction costs, often reflected in wider bid-ask spreads.¹
 - Lower share price and lower trading volume.¹
 - Lower institutional ownership.¹
 - Less analyst coverage.¹
 - Higher idiosyncratic volatility.¹
 - Smaller market capitalization (the "size effect"), where the drift is generally more significant.⁴ Illiquid stocks, typically smaller-cap companies, with higher transaction costs, consistently exhibit larger post-earnings drifts.¹
- **Earnings Autocorrelation:** While not the sole cause of PEAD, the positive serial correlation of quarterly earnings acts as an accelerator, strengthening the drift when earnings surprises are correlated over time.⁸ Investors' consistent failure to fully account for this positive autocorrelation contributes to their underestimation of future implications based on current announcements.⁸
- **Magnitude of Surprise:** A direct and systematic relationship exists between the magnitude of the earnings surprise and the strength of the post-announcement drift;

larger surprises typically lead to more pronounced PEAD.⁸

- **Technological Advancement and Decline of PEAD:** Recent academic studies indicate a discernible trend of PEAD reducing in magnitude and scope, particularly for larger capitalization stocks.⁷ This decline is largely attributed to significant technological advancements that have improved information distribution, processing efficiency (e.g., real-time data feeds, AI-driven synthesis), and reduced market friction through lower transaction costs.⁷ However, the anomaly continues to persist, especially in smaller-cap stocks where information barriers and liquidity constraints may still be prevalent.⁷ The ongoing proliferation of artificial intelligence in finance is expected to further limit PEAD in the future by enhancing information synthesis and market efficiency.⁷

The observation that portfolio coverage sharply increases around earnings calls and then decreases points to a strategy that is primarily focused on the immediate, short-term price reaction to earnings announcements. However, the comprehensive research on PEAD consistently highlights that it is a *drift* phenomenon, meaning prices adjust *slowly* over weeks or months, not instantaneously.¹ If a strategy is closing positions shortly after the initial announcement, it is inherently missing the prolonged period during which the majority of the abnormal returns associated with PEAD materialize. Therefore, the fluctuating coverage is not a flaw in the PEAD anomaly's existence, but rather a misalignment between the strategy's operational holding period and the actual duration of the market's underreaction. This suggests that the current strategy is leaving significant alpha on the table by failing to capture the full, extended duration of the PEAD. It is also likely incurring unnecessary transaction costs due to frequent entry and exit, rather than leveraging the sustained price movement. This necessitates a fundamental re-evaluation of the strategy's holding periods and rebalancing frequency to align with the empirical evidence of PEAD's persistence. Furthermore, the academic literature clearly states that the magnitude of PEAD is decreasing, especially for larger, more liquid firms, while it tends to persist more strongly in smaller-capitalization stocks.⁷ This trend is a direct consequence of improved market efficiency driven by technological advancements. If a strategy primarily targets larger, more liquid companies, the historical alpha from PEAD might be diminishing, potentially leading to lower returns or requiring a strategic shift towards less liquid, smaller-cap names. However, trading in smaller, less liquid stocks introduces its own set of challenges, including higher execution risks and increased transaction costs. This implies that the strategy needs to be dynamic and adaptive. A rigid reliance on the historical strength of PEAD across all market capitalization segments may lead to underperformance. A refined strategy should either strategically concentrate on smaller, less-covered stocks (while implementing robust risk management for illiquidity) or integrate complementary alpha sources and factors to compensate for the reduced PEAD effect in highly efficient market segments. This underscores the need for continuous research and adaptation within quantitative strategies. Despite significant advancements in information technology and market efficiency, PEAD persists, largely attributed to ongoing information asymmetry and inherent behavioral biases among market participants.¹ The finding that delayed disclosure of financial information leads to a stronger PEAD¹ is particularly noteworthy. It suggests that even after formal reports are

filed, the market's processing of complex or withheld information is not instantaneous. Furthermore, psychological factors like naive forecasting models ¹ and cognitive biases ⁷ prevent investors from fully and immediately incorporating all relevant data. This implies that the strategy should move beyond a simplistic numerical "surprise" filter. It should incorporate qualitative and quantitative assessments of factors that contribute to underreaction. This could involve analyzing the complexity of a company's earnings report, the level of analyst coverage (less coverage often correlates with greater underreaction), and qualitative signals related to management's communication style or industry-specific information barriers. By understanding

why the market underreacts, the strategy can better identify and exploit opportunities where the drift is likely to be more pronounced and sustained.

Table 1: Key Characteristics and Implications of Post-Earnings Announcement Drift (PEAD)

Characteristic/Factor	Description	Primary Explanations	Implications for Strategy
Definition	Tendency for stock returns to drift in direction of earnings surprise.	Investor underreaction, delayed information processing, behavioral biases (e.g., naive expectations, sentiment, herding), limits-to-arbitrage (transaction costs).	Current short holding periods miss extended alpha opportunities.
Typical Duration	Weeks to months (e.g., 60 days, up to 9-12 months).	Mispricing due to slow information assimilation.	Strategy needs to extend holding periods to capture full drift.
Stronger For (Factors)	Smaller firm size/market capitalization, higher illiquidity/transaction costs (wider bid-ask spreads), lower institutional ownership, less analyst coverage, higher idiosyncratic volatility, higher earnings autocorrelation, greater magnitude of surprise, higher delayed disclosure.	Information barriers, less arbitrage activity, greater underreaction.	Guides stock selection towards higher-potential, but potentially riskier, opportunities. Requires careful liquidity management.
Current Trend	Declining in magnitude	Improved information	Strategy must adapt:

	for large-cap stocks due to technology, but persistent in small-cap/illiquid stocks.	efficiency, reduced market friction.	focus on small-cap, or integrate other alpha sources for large-cap.
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III. Problems Arising from Fluctuating Portfolio Coverage in Earnings Surprise Strategies

The observed fluctuation in portfolio coverage, characterized by sharp increases around earnings call periods and subsequent decreases, introduces several significant problems that can severely impact the overall performance, risk profile, and scalability of an earnings surprise trading strategy.

Elevated Transaction Costs

The strategy's implied high turnover, with positions rapidly initiated and then liquidated around earnings announcements, inherently leads to substantial transaction costs. Bid-ask spreads, which represent the immediate cost of executing a trade, are known to widen significantly during earnings announcements due to heightened market volatility and increased information asymmetry.¹ This directly erodes the profitability of each individual trade, as the cost of entering and exiting positions is disproportionately higher during these critical, active periods.¹⁰

Beyond explicit spreads, **slippage**, defined as the difference between the expected price of a trade and its actual execution price, is exacerbated in volatile markets and during high-impact news events like earnings reports.¹² This unexpected price difference can significantly reduce realized trade gains, especially for larger orders, further diminishing the overall profitability of the strategy.¹² Academic studies explicitly highlight that PEAD is more pronounced for stocks already characterized by higher transaction costs.¹ This creates a critical dilemma: the very stocks that offer the strongest PEAD signal might also be the most expensive to trade frequently, thereby creating a substantial drag on net returns and potentially negating the theoretical alpha.

The description of fluctuating coverage implies a strategy that actively "times" the earnings season, entering and exiting positions rapidly. While the explicit costs of this approach, such as heightened transaction fees from increased bid-ask spreads and slippage during volatile earnings periods, are evident¹, there is a significant *implicit* cost: suboptimal capital utilization. If capital is only actively deployed during brief,

intense earnings windows, it remains underutilized or generates lower returns during the longer "off-season" periods. This directly impacts the overall annualized return on capital for the portfolio, which is a critical metric for evaluating any quantitative strategy's efficiency and profitability.

Suboptimal Capital Utilization

When portfolio coverage sharply decreases after the immediate earnings call period, a substantial portion of the trading capital remains idle or is deployed in less optimal, non-earnings-related opportunities. This leads to inefficient capital utilization, as the strategy's alpha generation is concentrated in brief, intense periods around earnings announcements. This intermittent deployment of capital consequently reduces the overall annualized return on capital. By not consistently being exposed to the potential gains from the extended PEAD phenomenon—which, as discussed, can last for weeks to months¹—the strategy misses out on significant profit opportunities that occur outside the immediate post-announcement window. This indicates that the strategy needs to evolve from a "seasonal sprint" to a "marathon" approach. This means aiming for more continuous, albeit potentially lower-intensity, exposure to the PEAD anomaly throughout its documented multi-month duration, rather than just at the immediate announcement. This shift necessitates a fundamental re-evaluation of current holding periods and rebalancing frequency to maximize the time-weighted deployment of capital.

Concentration Risk

During earnings season, when portfolio coverage is at its peak, the strategy inherently becomes heavily concentrated in a relatively small number of stocks undergoing earnings announcements. This significantly increases idiosyncratic risk, making the portfolio highly susceptible to company-specific negative events, unexpected market reactions, or even unforeseen regulatory changes impacting a few key positions.¹⁴ A lack of broad diversification across sectors, market capitalization, or other uncorrelated factors during these concentrated periods can lead to outsized losses if even a few key positions move adversely, disproportionately impacting overall portfolio performance and potentially leading to significant drawdowns.¹⁴

Exacerbated Short Selling Risks

The short component of the strategy, which involves shorting earnings shock stocks, faces unique and amplified risks during volatile earnings periods. Short selling inherently carries the potential for unlimited losses, as a stock's price can theoretically rise indefinitely.¹⁵ The high

volatility characteristic of earnings announcements¹⁷ increases the likelihood of rapid, unexpected price surges in shorted stocks. Such surges can trigger **margin calls**, forcing the investor to deposit additional capital or liquidate positions at significant losses.¹⁵

Short squeezes represent a particularly acute threat in this context. These occur when a heavily shorted stock experiences positive news or an unexpected price increase, prompting short sellers to cover their positions by buying back shares. This increased buying demand further drives up the stock price, creating a vicious feedback loop that forces more short sellers to cover, exacerbating the price increase and leading to severe losses.¹⁵

Borrow costs, encompassing both margin interest and stock borrowing fees, can quickly accumulate, especially if short positions are held for extended periods or if the stock becomes "special" (difficult to borrow) in the securities lending market.¹⁵ Corporate actions, such as dividend distributions, also lead to increased borrow fees and potential adverse tax consequences for short sellers, as they are typically liable for compensating the lender for these distributions.¹⁵ The general difficulty in accurately timing market declines¹⁵ is further intensified by the rapid and often unpredictable price movements around earnings announcements, making the short leg of the strategy particularly challenging to manage. The inclusion of shorting stocks with negative earnings shocks, while theoretically aligned with the PEAD anomaly, presents exceptionally high risks. The inherent dangers of short selling (unlimited loss potential, margin calls, short squeezes, escalating borrow costs)¹⁵ are significantly

exacerbated when combined with the extreme volatility and rapid price movements characteristic of earnings season.¹⁷ A small, unexpected piece of positive news or a market rumor for a heavily shorted stock could trigger a severe short squeeze, leading to devastating losses and immediate margin calls, particularly for smaller, illiquid stocks where PEAD is often stronger but shorting risks are magnified. This implies that the short leg of the strategy demands particularly stringent and dynamic risk management. This includes implementing more conservative position sizing, setting strict stop-loss orders, and carefully monitoring stock borrow availability and associated costs. It also suggests that the "short" side of the PEAD anomaly, while theoretically present, might be considerably harder to capture profitably in practice due to these amplified execution and capital risks. This may lead to an asymmetric risk-reward profile for the long versus short components of the strategy.

Scalability and Consistency Challenges

The intermittent nature of portfolio coverage poses significant challenges for scaling the strategy effectively. Large capital allocations may struggle to find sufficient high-quality opportunities during off-peak earnings periods, leading to under-deployment. Conversely, if large volumes are forced into concentrated earnings windows, they may face increased market impact costs (the effect of large orders moving the price against the trader) due to limited liquidity. Achieving consistent returns over time becomes difficult when the strategy's

exposure and risk profile fluctuate wildly. This inconsistency complicates performance attribution, accurate risk measurement, and long-term strategic planning, making it harder to assess the true effectiveness and sustainability of the strategy.¹⁸ The "fog of war" effect, where information is unclear during volatile periods, can also make it difficult to accurately price in an earnings surprise, further impacting the strategy's effectiveness and reliability.¹⁹ Effective portfolio management relies on maintaining a relatively stable and predictable risk profile for accurate performance assessment, proper attribution of returns, and alignment with long-term investment goals.¹⁸ The inconsistent portfolio coverage means that the portfolio's risk exposure and composition change dramatically between earnings season and the periods in between. This unpredictability makes it exceedingly difficult to accurately measure true risk-adjusted returns, identify the precise sources of alpha and beta, and implement systematic risk controls. Such unpredictability can lead to reactive, emotionally driven decisions rather than disciplined, systematic ones, potentially causing a deviation from established investment objectives.¹⁸ A critical area for improvement is to smooth out the portfolio's exposure and maintain a more consistent risk profile throughout the year. This will enable more robust analytical insights, facilitate better performance monitoring, and support more disciplined, systematic decision-making. Achieving this consistency will also allow for more effective scaling of the strategy and a clearer understanding of its long-term viability.

IV. Strategic Enhancements for Consistent Portfolio Performance

To address the challenges posed by fluctuating portfolio coverage and optimize the earnings surprise strategy, a multi-faceted approach focusing on trade execution, advanced stock selection, robust risk management, and continuous portfolio oversight is essential.

A. Optimizing Trade Execution and Holding Periods

The core of enhancing this strategy lies in aligning trading operations with the documented nature of the Post-Earnings Announcement Drift.

Leveraging the Full Duration of the Post-Earnings Announcement Drift

Instead of rapidly decreasing portfolio coverage after the immediate earnings call, the strategy should be designed to capture the full extent of the PEAD. As established, this drift can persist for several weeks to months.¹ Academic studies suggest optimal holding periods of at least 60 days¹ or even up to 9 months⁵ to fully exploit the anomaly. The research indicates that the "full correction of the price only occurs at the next earnings

announcement".¹ This implies that positions can be held until the subsequent quarterly earnings cycle for that specific company to capture the complete underreaction and maximize the drift. This fundamental shift from a short-term, event-driven trade to a medium-term, anomaly-driven investment is crucial for consistent capital utilization and maximizing the capture of alpha.

While research suggests PEAD can last "weeks to months" ¹, "at least 60 days" ¹, "up to 9 months" ⁵, or "up to a year" ⁷, this variability implies that a single, rigid holding period (e.g., always 60 days) might not be universally optimal. The duration and strength of the drift can vary based on factors like the magnitude of the surprise, the stock's liquidity, and its historical PEAD persistence. Therefore, the strategy needs to evolve beyond a static "hold for X days" rule. It should incorporate dynamic exit rules based on real-time signals. These could include exiting when the price momentum in the direction of the drift significantly wanes, pre-defining profit targets based on historical PEAD magnitudes for similar stocks, or holding until the subsequent earnings announcement for that specific company, as this is when the full price correction often occurs.¹ Adaptive rebalancing, based on a combination of time (e.g., quarterly) and performance triggers (e.g., if a position reaches a certain profit/loss or deviates significantly from its expected drift path), implies a need for continuous monitoring of open positions.

Strategic Entry and Exit Points

Precision in entry and exit is paramount for maximizing profitability and minimizing costs.

- **Entry Timing:** Entry into positions should ideally occur shortly after the earnings announcement, as the profitability of PEAD strategies tends to decrease with delays in execution.⁸ A common and empirically supported practice is to initiate positions on the second day after the actual earnings announcement ⁹, allowing for initial volatility to subside while still capturing the early stages of the drift.
- **Order Types:** Critically, **limit orders** are highly recommended over market orders for both entry and exit.⁸ Market orders are generally unprofitable for PEAD strategies due to wide bid-ask spreads and high slippage in volatile earnings environments.⁸ Limit orders, by allowing traders to specify the exact price at which they are willing to trade, can significantly mitigate transaction costs and yield positive excess returns even after accounting for spreads.⁸
- **Exit Strategy:** Predetermined exit points are essential for disciplined risk management and profit-taking.¹⁵ For PEAD strategies, this could be based on the empirically observed typical drift duration (e.g., 60 days, or quarterly rebalancing), the approach of the next earnings announcement, or a predefined profit target/stop-loss level.

Recommended Holding Periods for Long and Short Positions

A quarterly rebalancing period (equivalent to approximately 60 working days) is a common and empirically supported practice in academic PEAD strategies.³ This aligns well with the documented duration of the drift. While the drift applies to both positive and negative surprises, the inherent risks of short selling (e.g., unlimited loss potential, borrow costs, short squeezes)¹⁵ might necessitate a more cautious approach for the short leg. This could involve tighter stop-losses or potentially shorter holding periods for short positions compared to long positions, to manage the amplified risks during volatile earnings periods.

B. Advanced Stock Selection and Filtering

Moving beyond a simplistic numerical "surprise" filter is crucial for identifying higher-quality earnings surprise opportunities and ensuring the persistence of the alpha signal.

Fundamental Screening Criteria

- **Quality of Earnings:** It is imperative to go beyond headline earnings beats. Prioritize companies demonstrating robust, sustainable revenue growth rather than those achieving "beats" through one-time events, aggressive cost-cutting measures, or "accounting gimmickry".⁵ The benefits of the latter are often short-lived and unsustainable, failing to support a persistent price drift. This ensures the underlying fundamental strength supports the price movement.
- **Forward Guidance:** A critical analysis of management's forward guidance is essential. A strong beat on past earnings can be entirely negated by a poor future outlook, leading to immediate stock price declines despite the "surprise".⁵ Investors primarily value future earnings streams, so positive guidance is a crucial confirming signal for sustained price movement.
- **Analyst Estimate Revisions and Dispersion:** Continuously monitor trends in analyst consensus estimates, recent revisions (upward for long positions, downward for short positions), and the dispersion of individual analyst forecasts.⁶ Higher dispersion among analysts might indicate greater uncertainty or a more divided market opinion, potentially leading to larger initial underreactions and thus stronger, more prolonged PEAD. Additionally, consider "earnings whispers," which can precede significant surprises and offer early signals.⁵
- **Delayed Disclosure (DD):** Incorporate a filter for delayed disclosure. While PEAD is stronger in firms with higher DD¹, higher DD also increases arbitrage risk and uncertainty, potentially making the initial trade less efficient. Focusing on lower DD stocks might yield more immediate, cleaner signals, or a nuanced approach is required to balance the higher alpha potential with increased execution risk.

The strategy's reliance on "earnings surprises" alone is insufficient. A company might "beat" analyst estimates, but if that beat is due to unsustainable "accounting gimmickry" or if

management issues poor "forward guidance," the stock price can still fall sharply.⁵ This means a purely quantitative filter based solely on the surprise magnitude is insufficient and can lead to "value traps." The

quality of the earnings beat (e.g., driven by robust revenue growth) and its *implications for future earnings* (via guidance) are paramount. This implies that the stock selection process must integrate deeper fundamental analysis. This requires a sophisticated quantitative model that incorporates metrics beyond just EPS surprise, such as revenue growth, gross margin trends, cash flow generation, and the tone and substance of management's forward-looking statements. This moves the strategy from a purely statistical arbitrage play (reacting to a number) to one that incorporates fundamental insights into a company's underlying health and future prospects, thereby improving the quality and persistence of the alpha signal.

Quantitative Measures for Earnings Surprise

To precisely quantify earnings surprises, two key measures are widely utilized:

- **Standardized Unexpected Earnings (SUE):** This common measure is calculated as $(\text{Actual EPS} - \text{Expected EPS}) / \text{Standard Deviation of Earnings Surprises}$.⁹ It quantifies the magnitude of the surprise relative to the historical volatility of earnings innovations.
- **Earnings Announcement Return (EAR):** This measures the abnormal return for firms over a three-day window centered on the last announcement date, in excess of a benchmark.⁹ Research suggests that strategies combining SUE and EAR can generate higher abnormal returns.⁹ Moreover, EAR strategies may exhibit less reversal after three quarters compared to SUE alone, indicating a more persistent signal.⁹

Technical Indicators

- **Historical Price Action and Volatility:** Analyze a stock's historical price reactions around earnings announcements to identify patterns of elevated volume and volatility.¹⁷ Stocks that typically show strong reactions (either upward or downward) are generally preferable for this strategy, as they offer more tradable movements.³²
- **Volume Analysis:** Higher trading volumes usually correlate with tighter bid-ask spreads¹¹, indicating better liquidity and lower transaction costs. This can be used as a filter to select more efficiently tradable stocks.
- **Momentum Indicators:** Both price momentum and earnings momentum are strongly connected to the PEAD phenomenon.⁹ Integrating momentum signals can help confirm the direction and strength of the drift.
- **Other Technical Filters:** Consider applying additional technical filters such as Relative Strength Index (RSI) to identify oversold or overbought conditions³³, average volume thresholds to ensure sufficient liquidity³³, and Beta to understand a stock's sensitivity to broader market movements.³³ Price charts with visual indicators of historical surprises

can also provide quick insights.³⁴

Liquidity Considerations

Acknowledge the inherent trade-off: PEAD is empirically stronger in illiquid stocks¹, those with lower share prices and trading volumes.¹ While these names offer potentially greater alpha, they also come with significantly higher transaction costs (wider bid-ask spreads) and greater execution challenges.¹ To manage this, implement strict liquidity filters to exclude extremely illiquid names that would make profitable execution difficult. For stocks that are less liquid but still meet other criteria, mandate the exclusive use of limit orders⁸ and potentially reduce position sizes to minimize market impact. For very large institutional orders, the use of dark pools can minimize market impact, though this may be beyond the scope of typical retail or smaller institutional execution methods.¹⁹

Research consistently shows that PEAD is stronger in illiquid stocks, those with lower trading volumes, and higher transaction costs.¹ This creates a significant dilemma for the strategy: the highest alpha potential is often found in the very stocks that are most expensive and difficult to trade. Simply avoiding illiquid stocks means foregoing the strongest PEAD signals, but trading them frequently with market orders means incurring prohibitive costs. Therefore, the strategy requires a highly nuanced approach to liquidity management. This could involve a tiered approach, categorizing potential PEAD stocks by liquidity. For highly liquid stocks, one might accept potentially lower PEAD magnitude but benefit from lower transaction costs and easier, more scalable execution. For less liquid stocks where PEAD is stronger, a strict mandate for using limit orders is essential⁸, allowing for better price capture, even if it means a higher non-execution risk. Additionally, for illiquid names, implementing more conservative position sizing³⁵ is crucial to minimize market impact and the risk of being stuck in a position. The short leg of the strategy for illiquid stocks is particularly challenging due to potential borrow constraints, escalating borrow costs, and increased susceptibility to short squeezes, which may necessitate even more stringent filters or exclusion from the short universe.

Table 3: Recommended Fundamental and Technical Screening Criteria for Earnings Surprise Strategies

Category	Criterion	Description	Significance for Strategy
Fundamental Screening	Quality of Earnings	Focus on robust revenue growth rather than cost-cutting or accounting maneuvers.	Sustainable earnings quality indicates true business health, supporting persistent drift.
	Forward Guidance	Management's outlook for future quarters.	Future earnings expectations drive long-term valuation; strong guidance

			confirms positive surprise, weak guidance negates it.
	Analyst Estimate Revisions	Recent upward (for long) or downward (for short) revisions by analysts.	Indicates evolving market sentiment and potential for continued underreaction/overreaction.
	Analyst Dispersion	The spread of individual analyst forecasts for earnings.	Higher dispersion can signal greater uncertainty and potential for larger surprises or prolonged underreaction.
	Delayed Disclosure (DD)	Level of information withheld or delayed in financial reporting.	Higher DD can amplify PEAD due to prolonged information asymmetry (trade-off to consider).
Quantitative Measures for Earnings Surprise	Standardized Unexpected Earnings (SUE)	(Actual EPS - Expected EPS) / Std Dev of Earnings Surprises.	Quantifies surprise magnitude relative to historical volatility.
	Earnings Announcement Return (EAR)	Abnormal return over 3-day window around announcement.	Captures immediate market reaction; combining with SUE can yield higher returns and more persistent drift.
Technical Indicators	Historical Volatility / Price Reaction	Past stock price swings and reactions to earnings announcements.	Identifies stocks prone to strong, tradable movements post-surprise.
	Volume	Average daily trading volume.	Higher volume indicates better liquidity, lower transaction costs (tighter spreads), and easier execution.
	Momentum (Price & Earnings)	Trend in stock price and underlying earnings.	PEAD is linked to momentum; confirms direction and strength of drift.

	Relative Strength Index (RSI) / Other Oscillators	Indicator of overbought/oversold conditions.	Can help optimize entry/exit points, avoiding trades at extreme levels.
	Beta	Stock's sensitivity to overall market movements.	Helps understand systematic risk exposure and potential for market-driven movements to influence PEAD.

C. Robust Risk Management Frameworks

Effective risk management is fundamental to the long-term viability and profitability of any quantitative strategy, especially one exposed to the volatility of earnings announcements.

Dynamic Position Sizing

Position sizing is a cornerstone of effective capital allocation and financial risk management.³⁵ It ensures that the amount of capital allocated to any single trade is proportional to the overall account size and the user's risk tolerance.³⁶ Several methods can be employed:

- **Risk-Based Position Sizing:** This method involves determining how much money one is willing to lose on a single trade. A maximum acceptable risk per trade is defined as a percentage of total capital (e.g., 1-2%). The position size is then determined by dividing this maximum risk by the defined risk per unit (entry price minus stop-loss price).³⁵ This method is crucial for capital preservation.
- **Volatility-Based (ATR) Position Sizing:** This technique utilizes the Average True Range (ATR) or similar volatility measures to dynamically adjust position sizes. More volatile assets should be assigned smaller position sizes to account for wider price swings, while less volatile assets can accommodate larger positions.³⁵ This helps prevent premature stop-outs during normal market fluctuations and ensures consistent risk exposure across trades.
- **Exposure-Based Position Sizing:** This method involves implementing limits on the maximum percentage of the portfolio allocated to any single asset, sector, or even a group of highly correlated assets.³⁵ This ensures diversification and reduces the impact of a single adverse event, preventing overconcentration.
- **Kelly Percentage:** While more aggressive, the Kelly Criterion is a mathematical formula that calculates the optimal position size to maximize the long-term growth rate of

capital, based on the strategy's win rate and risk-reward ratio.³⁵ It is a powerful but potentially high-risk method that requires accurate historical data and precise parameter estimation.

Table 2: Comparative Analysis of Position Sizing Methods for Event-Driven Strategies

Method	Description	How it Works	Primary Benefit	Potential Drawbacks (Context)
Risk-Based Position Sizing	Determines position size based on a fixed percentage of capital risked per trade.	Define max % capital loss per trade; calculate risk per unit (entry-stop); divide max risk by risk per unit.	Capital preservation, limits downside.	Requires clear stop-loss, may not adapt to changing volatility.
Volatility-Based (ATR) Position Sizing	Adjusts position size inversely to an asset's volatility.	Uses Average True Range (ATR) to measure volatility; smaller positions for higher ATR, larger for lower ATR.	Consistent risk exposure across volatile and calm periods.	May reduce exposure to highly volatile, high-alpha PEAD opportunities if not carefully calibrated.
Exposure-Based Position Sizing	Limits the maximum capital allocated to any single asset or sector.	Sets a fixed percentage of total portfolio value for any single position or sector.	Ensures diversification, prevents overconcentration.	Can limit upside if a strong signal emerges in an already exposed sector.
Kelly Percentage Position Sizing	A mathematical formula to calculate optimal bet size to maximize long-term capital growth.	$\text{Kelly \%} = \text{Win Probability} - (1 - \text{Win Probability}) / \text{Risk-Reward Ratio}$.	Aggressively optimizes growth, theoretically maximal.	Requires accurate estimation of win rate and risk-reward, highly sensitive to inputs, can lead to very large, risky positions, often too aggressive for practical use.

Portfolio Diversification

Diversification is paramount to reducing overall portfolio volatility and mitigating risk, especially given the concentration inherent in earnings-driven strategies.³⁷

- **Diversify Across Asset Classes:** Beyond just stocks, consider including other asset classes like bonds, cash, and potentially real assets. This blend helps smooth investment performance, as different asset classes often generate uncorrelated returns and are subject to varying risk levels.¹⁴
- **Diversify Within Asset Classes:** Further diversify within the equity component by spreading investments across different industries/sectors.²⁵ This prevents overconcentration in specific high-growth or high-profile industries that might be susceptible to synchronized downturns.⁴⁰ Also, diversify by market capitalization (e.g., balancing small-cap PEAD plays with more stable large-cap holdings) and potentially by geography.³⁹
- **Negative Correlation:** Actively seek to incorporate negatively correlated assets or strategies into the broader portfolio. This means when one part of the portfolio declines, another part might increase, helping to offset losses and reduce overall volatility.³⁸

Traditional portfolio diversification focuses on spreading risk across asset classes, sectors, and geographic regions.³⁷ However, for an anomaly-driven quantitative strategy like earnings surprise, diversification should also extend to diversifying *across different types of market anomalies* or different drivers of PEAD. For example, some PEAD might be driven purely by investor underreaction to the numerical surprise (SUE), while others might be more influenced by delayed information disclosure¹ or specific behavioral biases.⁷ To achieve more consistent alpha generation and reduce the reliance on a single, seasonal anomaly, exploring combining the earnings surprise strategy with other uncorrelated quantitative factors (e.g., value, momentum, quality, low volatility, if not already implicitly captured) or other event-driven strategies (e.g., merger arbitrage, distressed investing, if aligned with the user's expertise and risk appetite)⁴³ would be beneficial. This multi-strategy approach would provide continuous alpha generation, smooth out returns during periods of low earnings activity, and reduce the overall portfolio's sensitivity to the cyclical nature and potential decline of the PEAD anomaly itself.

Hedging Techniques

Utilize options and other derivatives to mitigate downside risk, particularly for the short positions which carry unlimited loss potential.¹⁵

- **Long Calls/Puts:** Purchase call options to profit from anticipated upward movements or put options for downward movements, with risk limited to the premium paid.¹⁷
- **Straddles/Strangles:** For situations where a significant price movement is expected after earnings, but the direction is uncertain, these strategies (buying both a call and a put) can profit from increased volatility.³²
- **Covered Calls/Vertical Spreads:** For existing long positions, covered calls can

generate income, while vertical spreads can define risk and reward profiles for directional bets.¹⁷

- Implement strict **pre-defined exit points** and **stop-loss orders** for all positions, especially short sales, to limit potential losses and remove emotional decision-making.¹⁵

D. Continuous Portfolio Management and Rebalancing

Maintaining consistent exposure and adapting to evolving market dynamics are crucial for long-term success.

Systematic Rebalancing Strategies

Implement regular, systematic rebalancing (e.g., quarterly, aligning with PEAD's typical holding periods⁹) to maintain the target asset allocation and desired risk levels.¹⁴ Define clear rebalancing triggers, such as a deviation of 5-10% from the target allocation for any asset class.²⁰ This helps to avoid reactive, emotionally driven decisions driven by short-term market gyrations¹⁴ and ensures the portfolio remains aligned with long-term goals.

Adapting the Strategy to Evolving Market Microstructure and Information Efficiency

Continuously monitor the market for shifts in PEAD's effectiveness. As noted, PEAD's magnitude is declining, especially in larger, more liquid stocks, due to improved information efficiency.⁷ The strategy must adapt by potentially shifting focus to smaller-cap, less-covered stocks where the anomaly persists, or by integrating new, uncorrelated alpha sources. Regularly assess market microstructure factors, such as average bid-ask spreads, liquidity, and high-frequency trading activity, especially around earnings season.¹⁰ Adjust trading tactics (e.g., order types, execution algorithms) accordingly to minimize transaction costs and slippage.

Leveraging Technological Advancements for Ongoing Optimization

Explore the application of advanced data analytics, machine learning, and artificial intelligence methodologies for multi-dimensional analysis of PEAD.⁷ AI can enhance the synthesis of vast amounts of financial information, potentially uncover subtle drift patterns, and improve the accuracy of earnings surprise predictions. Automate trade entries and exits with sophisticated algorithms that incorporate strict rules, dynamic risk management, and adaptive position sizing.²² This reduces human error, improves execution speed, and allows for

more consistent application of the strategy.

V. Conclusion and Actionable Recommendations

The fluctuating portfolio coverage observed in the current earnings surprise strategy is a direct consequence of under-leveraging the full duration of the Post-Earnings Announcement Drift (PEAD) anomaly. To transform this into a consistently profitable and scalable strategy, the most impactful improvements involve extending holding periods to capture the multi-month drift, implementing sophisticated, multi-factor stock selection criteria, applying dynamic and robust risk management frameworks, and maintaining continuous portfolio oversight.

Based on the comprehensive analysis, the following prioritized, step-by-step actionable recommendations are provided for implementation:

1. **Re-evaluate and Extend Holding Periods:** Transition from short-term reactions to capturing the full multi-month PEAD. Implement a baseline quarterly rebalancing schedule (e.g., 60 working days) for positions. Consider dynamic exit rules based on momentum decay or the approach of the *next* earnings announcement for each specific stock, rather than a generic calendar period. This will ensure the strategy captures the sustained price adjustment inherent in PEAD, maximizing capital utilization over longer durations.
2. **Mandate Limit Order Execution:** Prioritize the exclusive use of limit orders for both entering and exiting positions. This is critical for minimizing transaction costs (bid-ask spreads) and slippage, especially in the volatile environment around earnings announcements and for less liquid stocks. Market orders should be avoided unless absolutely necessary and with strict price tolerance limits, as they significantly erode profitability.
3. **Enhance Stock Selection with Multi-Factor Filters:**
 - **Fundamental Quality:** Integrate fundamental screens focusing on the *quality* of earnings (e.g., robust revenue growth versus one-time cost-cutting measures) and the implications of management's *forward guidance*.
 - **Analyst Insights:** Incorporate analysis of analyst estimate revisions and dispersion to identify stronger signals and potential underreaction.
 - **Quantitative Measures:** Combine Standardized Unexpected Earnings (SUE) with Earnings Announcement Return (EAR) for a more robust and persistent signal, as research indicates combining these can yield higher returns.
 - **Liquidity Management:** Implement filters to manage liquidity. For illiquid stocks with strong PEAD signals, adjust position sizing downwards and strictly enforce limit order usage to mitigate execution risks.
4. **Implement Dynamic Position Sizing:** Adopt a systematic position sizing method, such as risk-based or volatility-based (Average True Range - ATR) sizing. This ensures consistent risk exposure across all trades and market conditions, optimizes capital

utilization, and protects against outsized losses from individual positions, moving away from ad-hoc sizing.

5. **Diversify Beyond Earnings Season:** Explore strategies to maintain more consistent portfolio exposure throughout the year. This could involve diversifying into other uncorrelated alpha sources or quantitative strategies that are not solely dependent on earnings announcements, thereby smoothing returns and reducing reliance on a single, seasonal anomaly. This broader diversification will contribute to more stable risk-adjusted returns over time.
6. **Strengthen Short Leg Risk Management:** For short positions, implement particularly stringent risk controls due to their unlimited loss potential and susceptibility to short squeezes. This includes setting tighter stop-loss orders, carefully monitoring stock borrow costs and availability, and being highly selective of names to short, especially illiquid ones prone to short squeezes. The use of options for hedging short exposure should also be considered.
7. **Leverage Advanced Data Analytics and Automation:** Invest in tools and capabilities for advanced data analytics and potentially machine learning. This can help refine earnings forecasting, identify subtle drift patterns, and automate the execution, risk management, and rebalancing processes, leading to greater efficiency, consistency, and the potential to uncover new alpha sources as market dynamics evolve.

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