Analytical Report:

Trader Behavior Insights and Sentiment Correlation

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EXECUTIVE SUMMARY

This report analyzes the trading behavior of Hyperliquid accounts in correlation with the Bitcoin Market Fear/Greed Index. We identified a cohort of "Smart Money" accounts whose trading volume and performance dictate optimal trading strategies.

The analysis yields three primary, actionable strategies:

Contrarian Volume Deployment: Smart Money deploys maximum capital during Fear periods.

Short-Trade Exit Signal: The highest average profit comes from Closing Short positions during Fear ($209.59 Avg PnL).

Long-Trade Exit Signal: Optimal exit for long positions is during Greed ($90.68 Avg PnL).

Trader Performance vs Market Sentiment

This report presents an end-to-end analysis of trader performance in relation to market sentiment. The objective was to understand how sentiment influences profitability, identify behavioral patterns, and uncover strategic insights by profiling highly profitable traders (Smart Money).

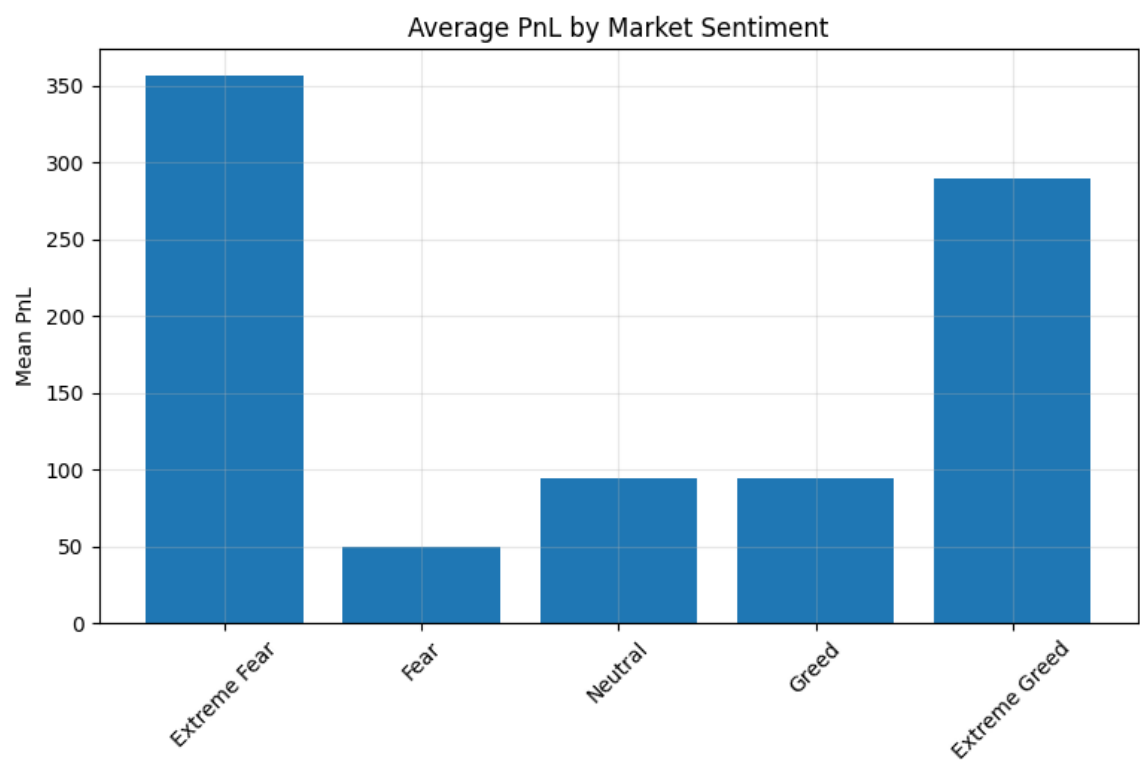## 1. Data Collection and Preprocessing

Two datasets were used in this assignment: historical trade-level data and the Fear & Greed Index. The primary challenge was aligning trade timestamps with daily sentiment data. To resolve this, trades were merged with the nearest available sentiment date using a tolerance of ±2 days. This ensured realistic alignment without discarding valid trade records.

Key preprocessing steps included:

- Parsing and normalizing timestamps into consistent datetime formats.
- Merging trade data with sentiment data using nearest-date matching.
- Standardizing categorical variables such as trade side, direction, and sentiment classification.
- Filtering redundant columns and retaining only those relevant to performance analysis.
- Creating derived features such as sentiment buckets, lag days, and trade execution hour.

2. Market-Level Sentiment Analysis

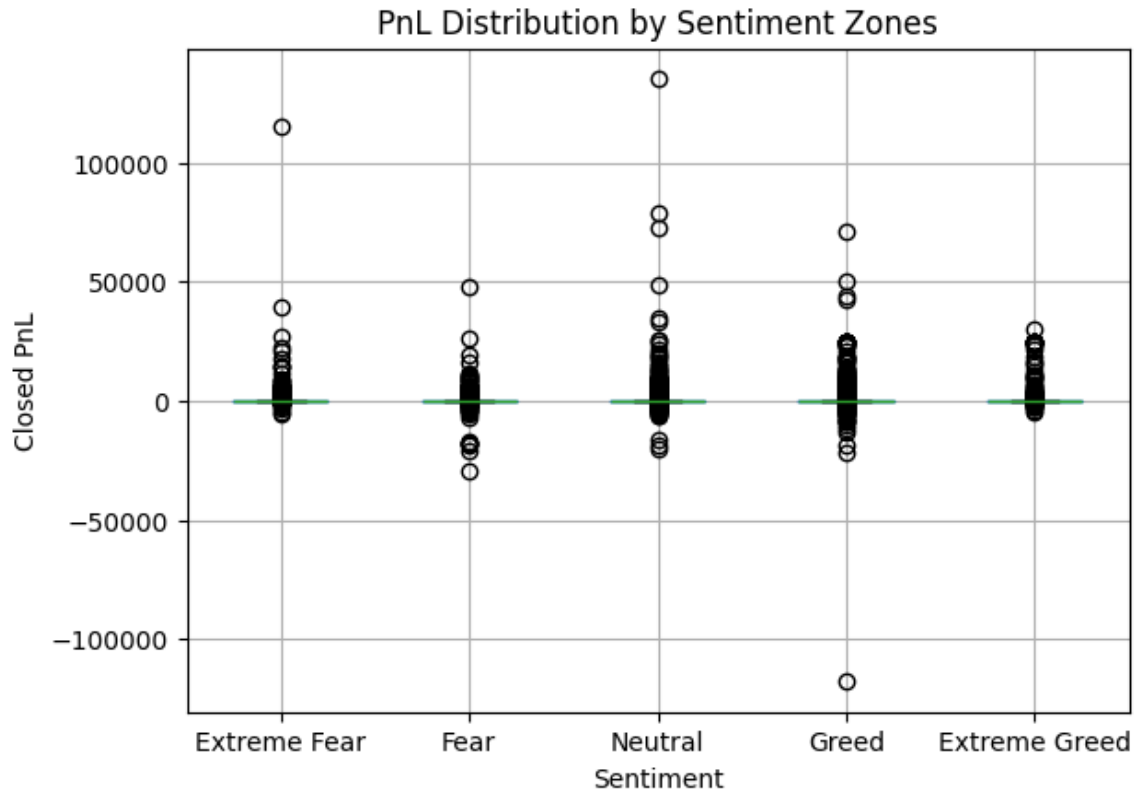**2.1 Average PnL by Market Sentiment**

This visualization compares the average Closed PnL across different sentiment regimes (Extreme Fear, Fear, Neutral, Greed, Extreme Greed).

1. Key Insights:

    Trader profitability peaks at sentiment extremes, particularly during Extreme Fear. Moderate sentiment phases show comparatively weaker average returns.

2.2 PnL Distribution by Sentiment (Risk Analysis)
Boxplots were used to analyze the dispersion of profits and losses across sentiment zones. This helps assess volatility and risk exposure under different emotional market conditions.
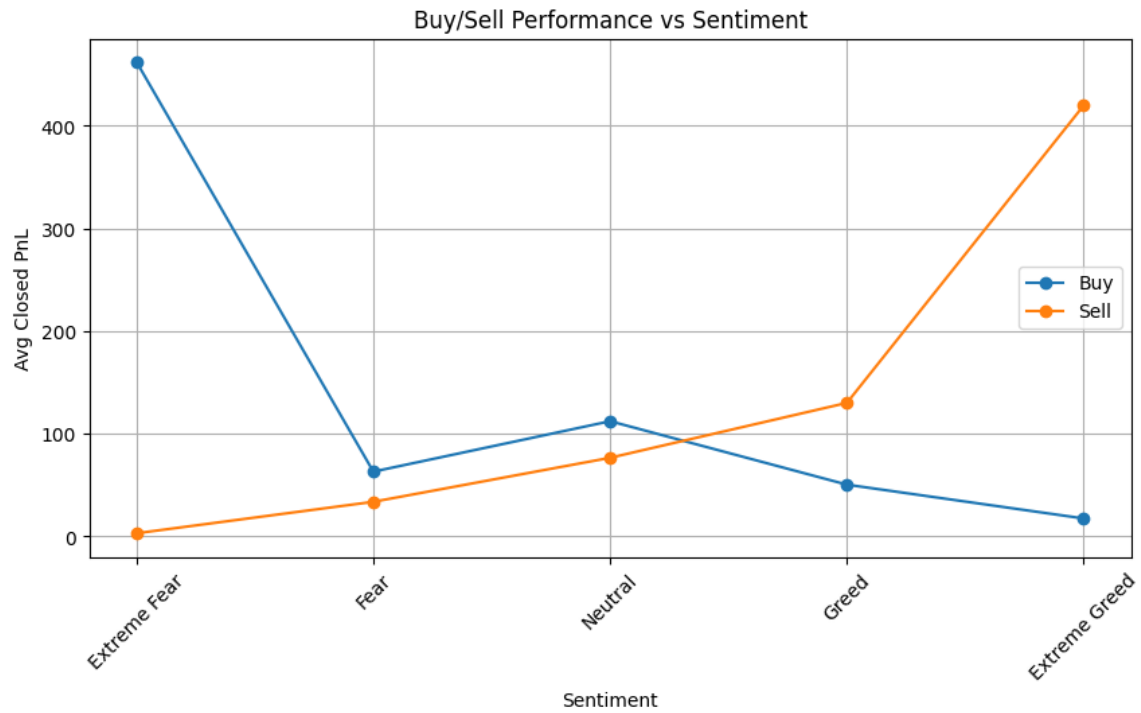
PnL Distribution by Sentiment Zones

2. Key Insights:

Extreme Fear and Extreme Greed exhibit the highest volatility with both large gains and losses.
Neutral and moderate sentiment phases are more stable but less profitable.

2.3 Buy vs Sell Performance Across Sentiment
This visualization compares Buy and Sell trade performance within each sentiment category.
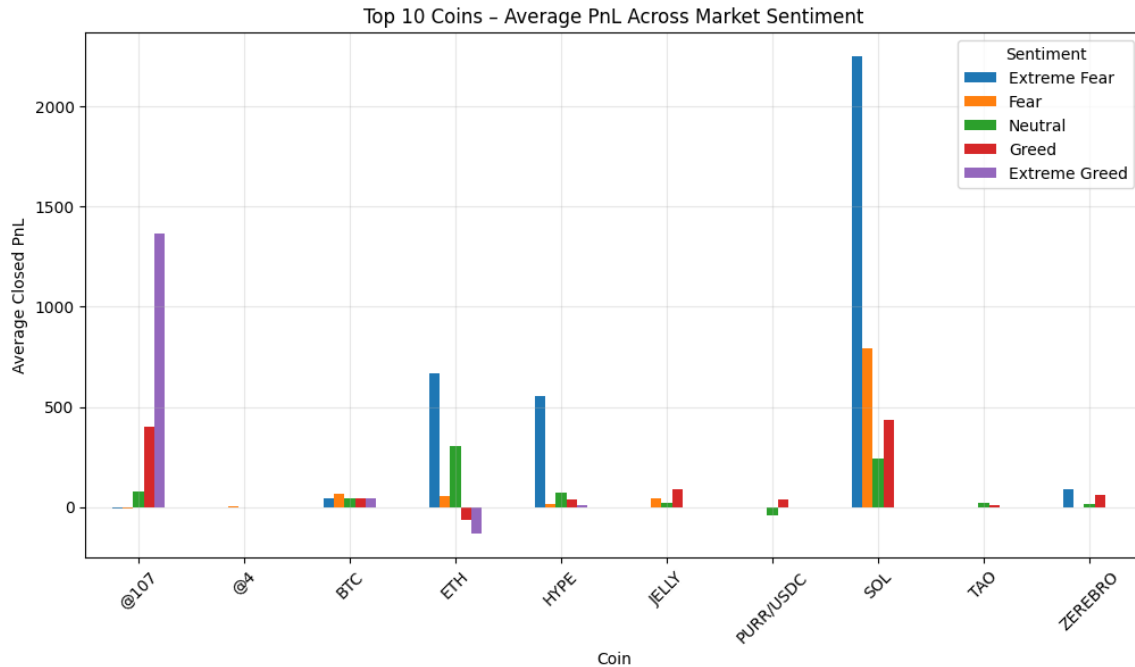
Buy/Sell Performance vs Sentiment

3. Key Insights:

Buy trades perform best during Extreme Fear, indicating contrarian accumulation. Sell trades dominate profitability during Extreme Greed, reflecting effective profit-taking.

3. Asset-Level and Timing Analysis

3.1 Coin-wise Performance Across Sentiment
To improve interpretability, analysis focused on the most actively traded coins. Average PnL across sentiment regimes was compared for these assets.

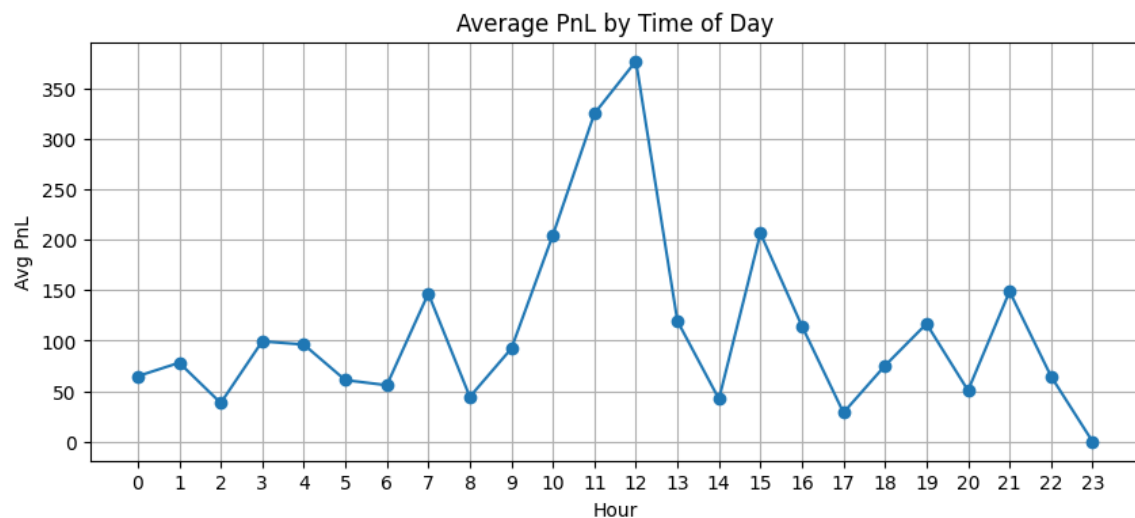Top 10 Coins – Average PnL Across Market Sentiment

4. Key Insights:

Only a subset of coins shows strong sensitivity to market sentiment.
Sentiment-based strategies are therefore asset-specific, not universal.

3.2 Time-of-Day Impact on Trading Performance
Trades were grouped by execution hour to analyze intraday performance variation.
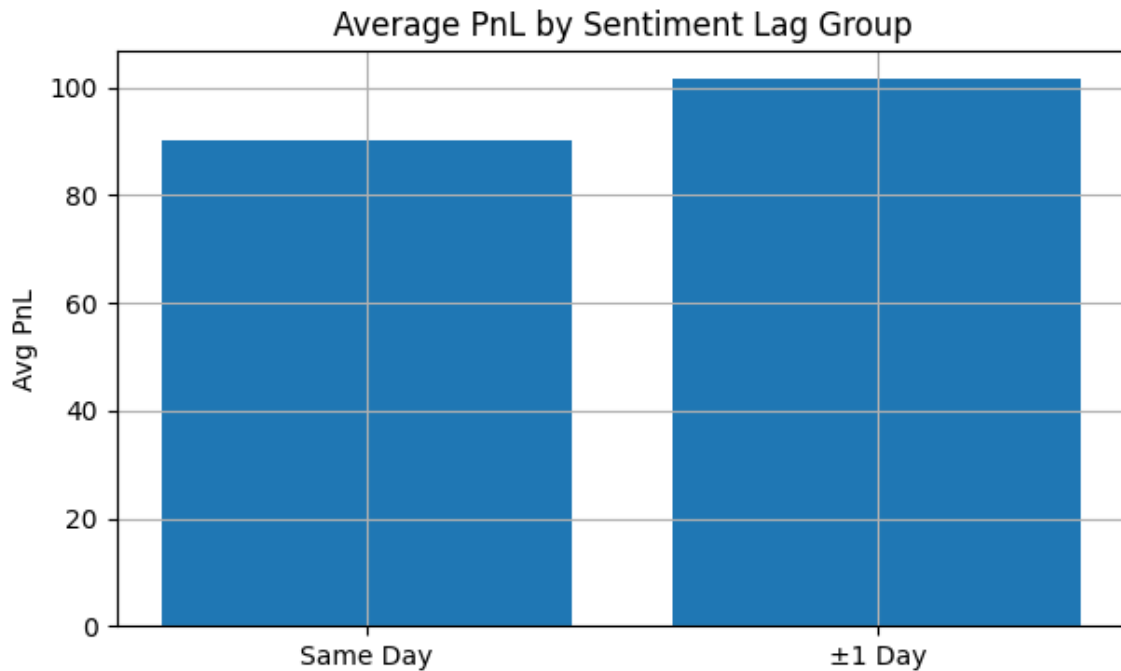

Average PnL by Time of Day

5. Key Insights:

Average profitability peaks during mid-day high-liquidity hours.
Late-night and low-activity periods show weaker performance.

3.3 Sentiment Lag Analysis

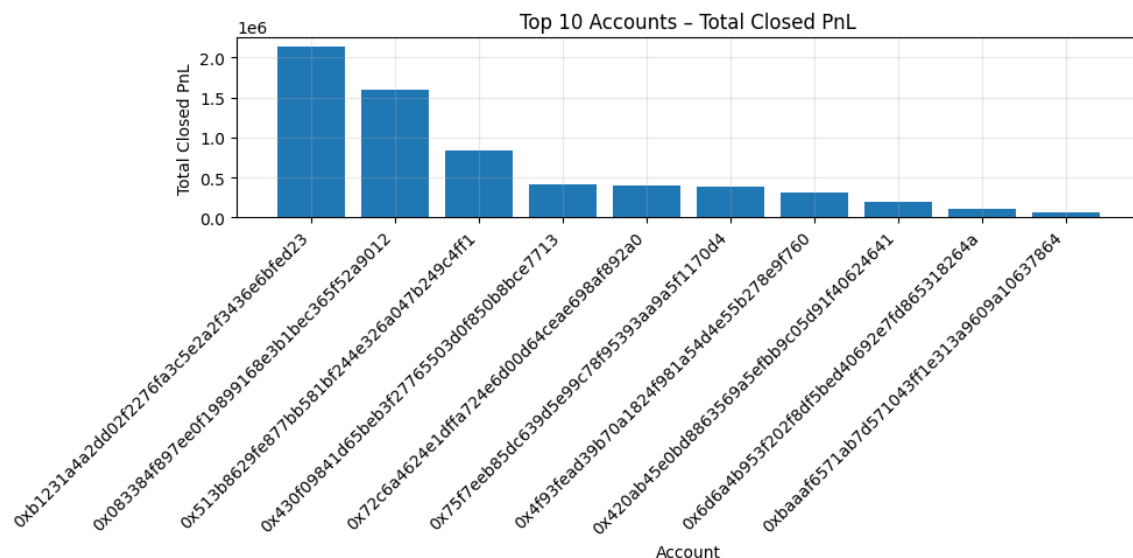This visualization compares trade performance based on the time lag between sentiment observation and trade execution.

Average PnL by Sentiment Lag Group

6. Key Insights:

Trades aligned with same-day or ±1 day sentiment perform better.
The predictive power of sentiment decays quickly over time.

4. Smart Money (Trader Profiling) Analysis

4.1 Identification of Smart Money Accounts

Accounts were ranked by total Closed PnL to identify consistently profitable traders. The top-performing accounts were classified as Smart Money.
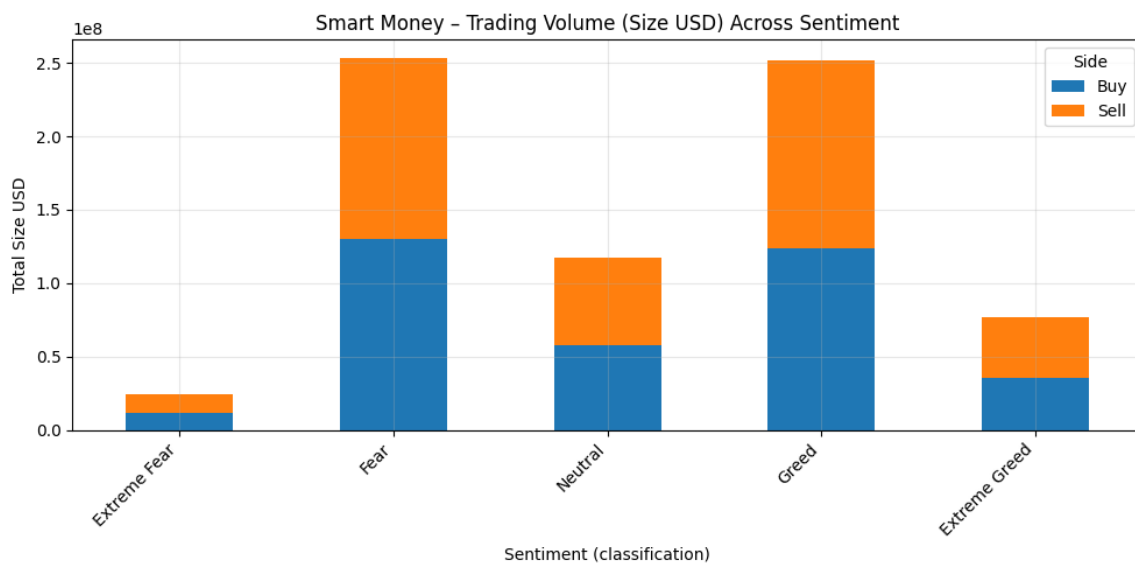
Top 10 Accounts – Total Closed PnL

7. Key Insights:

Profitability is highly concentrated among a small subset of traders.

4.2 Smart Money Behavior Across Sentiment
The trading volume and profitability of Smart Money were analyzed across sentiment regimes.

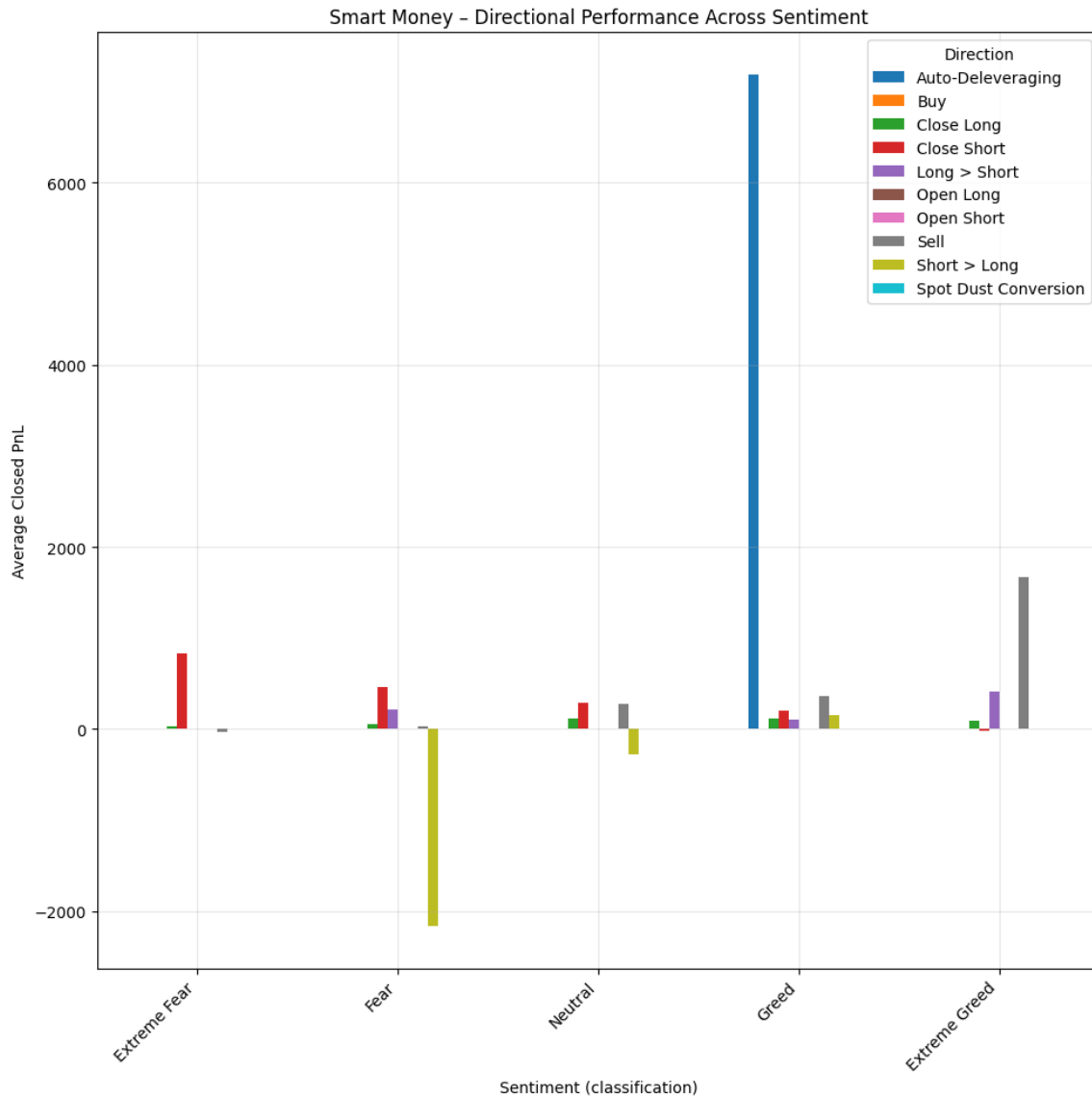Smart Money – Trading Volume (Size USD) Across Sentiment

8. Key Insights:

Smart Money increases trade size during Fear and Greed phases rather than panic extremes.
This indicates conviction-based and trend-aligned behavior.

4.3 Directional Strategy of Smart Money

Directional performance was evaluated by comparing profitability across sentiment and trade direction.

Smart Money – Directional Performance Across Sentiment

Key Insights:

Closing short positions during Extreme Fear generates strong profits.
Closing long positions during Extreme Greed is a key driver of Smart Money returns.

5. Conclusion

This analysis demonstrates that market sentiment plays a critical role in shaping trader performance, but its true value emerges when combined with trade direction, timing, asset selection, and trader profiling. Smart Money traders outperform not by reacting emotionally

but by executing disciplined, sentiment-aware position management strategies. These insights can be used to design more robust, sentiment-informed trading systems.