Trader Behavior Analysis Under Bitcoin Market Sentiment

Exploring the relationship between Fear–Greed sentiment and trading performance

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Executive Summary (MOST IMPORTANT SECTION)

This analysis examines how trader behavior and performance change under different Bitcoin market sentiment regimes (Fear vs Greed).

By combining historical trader data from Hyperliquid with the Bitcoin Fear & Greed Index, we identify clear behavioral patterns in risk exposure, trade frequency, and profitability.

The results show that traders tend to deploy higher capital and trade more frequently during Greed phases, while Fear periods exhibit reduced activity and more controlled risk behavior. However, higher risk-taking during Greed does not consistently translate into improved profitability.

Data Overview

Datasets Used

- Bitcoin Fear & Greed Index
- Historical Trader Data (Hyperliquid)

Key Features Analyzed

- Closed PnL
- Trade size in USD (risk exposure proxy)
- Trade frequency
- Sentiment classification (Fear / Greed)

Preprocessing Highlights

- Missing PnL values handled
- Duplicate trades removed
- Date alignment for sentiment merging

Methodology

Since direct leverage information was not available, risk exposure was approximated using trade size in USD.

Additional derived metrics such as absolute PnL and PnL-to-size ratio were used to assess volatility and capital efficiency.

Statistical testing was applied to evaluate whether observed differences between sentiment regimes were meaningful.

Key Findings

- **Risk Behavior:**
  Traders deploy higher average capital per trade during Greed phases, indicating increased risk appetite.
- **Trade Frequency:**
  Greed periods are associated with higher trading activity, suggesting possible overtrading behavior.
- **Profitability Distribution:**
  Most trades are breakeven, with overall profitability driven by a small number of high-impact trades.
- **Efficiency:**
  Increased risk-taking during Greed does not consistently improve profit efficiency.
- **Statistical Insight:**
  Sentiment regimes influence trading behavior more strongly than average profitability levels.

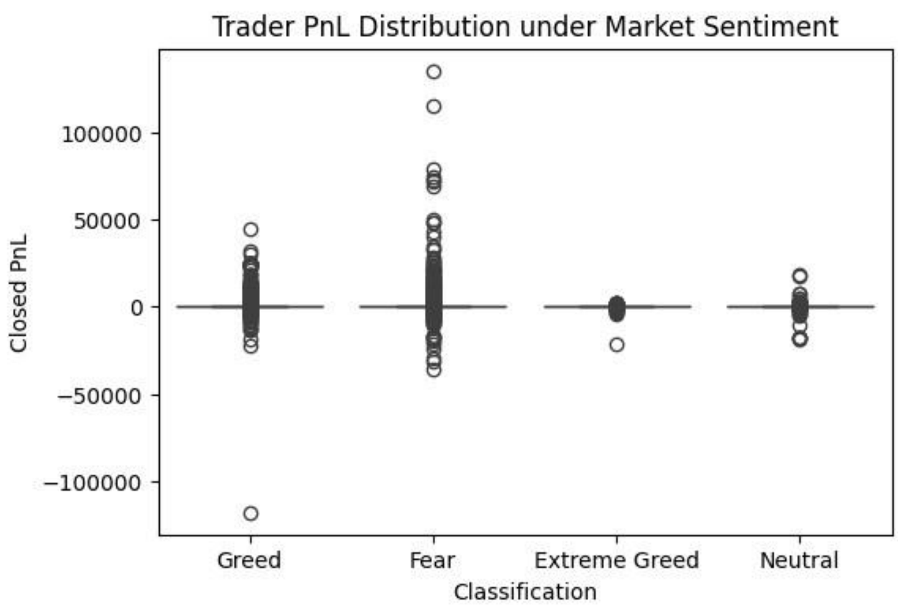

Fig-1: PnL distribution boxplot

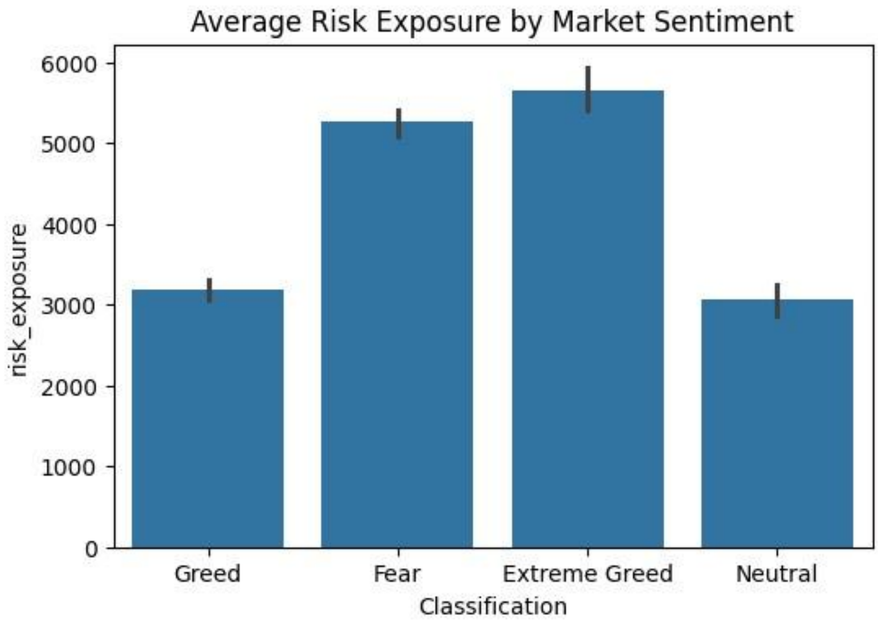

Fig-2: Risk exposure bar chart

Implications for Trading Strategy

- Traders should be cautious of overexposure during Greed phases.
- Risk controls may be more critical during periods of high optimism.
- Fear periods may offer more disciplined trading environments with lower volatility.
- Monitoring sentiment can help anticipate shifts in trader behavior rather than direct profitability.

Limitations & Future Work

This analysis is limited by the absence of direct leverage data and trader-level longitudinal performance tracking.

Future work could include:

- trader clustering (risk profiles)
- leverage-aware datasets
- sentiment lag analysis