Trader Behavior vs Market Sentiment - Detailed Analysis Report

Objective

The objective of this project is to analyze the alignment between trading behavior and market sentiment, focusing on metrics such as profitability, risk appetite, trade volume, and leverage usage. The analysis aims to discover whether traders act in harmony with public sentiment (Fear vs Greed) or diverge in significant ways.

Datasets Used

1. Bitcoin Market Sentiment Dataset
   - Contains daily sentiment classifications as either 'Fear' or 'Greed'.

2. Historical Trader Data from Hyperliquid
   - Includes details such as account, symbol, execution price, size, side (buy/sell), timestamp, leverage, start position, event type, and realized PnL.
   - This dataset provides granular insight into trading decisions and outcomes.

Methodology

1. Data Cleaning & Preprocessing:
- Timestamps were converted to consistent formats.
- Rows with null or extreme outliers were filtered.
- Both datasets were merged on timestamp (date) for comparative analysis.

2. Feature Engineering:
- Calculated average leverage, daily profit, trade volume.
- Classified each trade based on the current market sentiment.

3. Analysis Techniques:
- Distribution plots and histograms for leverage and PnL across sentiments.
- Group-by operations for summarizing metrics by sentiment.
- Identification of high-performing traders during Fear periods.
- Temporal trend visualizations for volume, profit, and risk indicators.

Key Findings

- Traders generally used higher leverage in periods of Greed, reflecting higher risk tolerance.
- Surprisingly, more consistent profits were observed during Fear periods for a subset of traders.
- Volume of trades was significantly higher in Greed phases, likely indicating herd behavior.
- Certain traders demonstrated contrarian behavior - making profitable trades during Fear, suggesting

potential for strategy development.

- The correlation between leverage and loss was more pronounced in Greed periods, indicating overconfidence.

Visual Analysis (Described)

- A KDE plot showed sharp spikes in leverage during Greed vs a flatter curve during Fear.
- Time-series plots indicated a drop in volume during Fear but rise in individual trade profitability.
- A scatter plot of leverage vs PnL during Greed showed many losses beyond 10x leverage.
- Boxplots for profit grouped by sentiment revealed higher outliers during Fear periods.

Conclusion

Trader behavior is evidently influenced by market sentiment, but not uniformly. While the majority follow the emotional current (high leverage and volume during Greed), some traders profit more consistently in contrarian positions during Fear. This insight presents opportunities to develop smart trading algorithms that go against the crowd and exploit market overreactions.

Recommendations

- Develop trading strategies that are sentiment-aware: reduce exposure in Greed, seek undervalued assets in Fear.
- Flag high-performing contrarian traders as potential signalers or algorithmic inputs.
- Enhance risk management tools to limit overleveraging during market optimism.
- Extend the framework to real-time data for more proactive decision-making.