Trader Behavior Insights Under Market Sentiment

1. Introduction

Cryptocurrency markets are highly influenced by emotions such as fear and greed. Traders often change their behavior based on overall market sentiment, which can affect profitability, risk-taking, and trading volume.
The purpose of this analysis is to understand how trader performance changes under different market sentiment conditions by combining historical trading data from Hyperliquid with the Bitcoin Fear & Greed Index.

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2. Datasets Description

Hyperliquid Historical Trader Data

This dataset contains trade-level information such as execution price, trade size, fees, and realized profit or loss (PnL). Each trade is timestamped, allowing analysis of trading activity on a daily basis.

Bitcoin Fear & Greed Index

This dataset provides daily market sentiment classifications such as Fear, Extreme Fear, Neutral, Greed, and Extreme Greed. It reflects overall market psychology on each day.

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3. Methodology

The analysis began by converting UNIX timestamps into readable datetime format. Trade-level data was then aggregated into daily metrics.
Both datasets were merged using the date column to align daily trading activity with the corresponding market sentiment.

Key metrics were created to analyze trader behavior:

- Total daily PnL
- Total trading volume
- Win rate (percentage of profitable trades)
- Number of trades per day

Since PnL and volume contained extreme values during high-volatility periods, logarithmic transformations were applied to improve visualization and comparison.

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4. Exploratory Data Analysis

PnL vs Market Sentiment

Fear periods showed very high total PnL on certain days, mainly driven by extreme volatility. Greed periods displayed wide variation in PnL, suggesting inconsistent performance and higher risk-taking behavior.

Trading Volume vs Market Sentiment

Trading volume was significantly higher during Fear periods. This indicates panic-driven trading, forced liquidations, and increased market participation during uncertain conditions.

Win Rate vs Market Sentiment

Extreme Greed showed the highest win rate, while Greed phases had the lowest win rate. This suggests that overconfidence during Greed phases often leads to poor trade decisions. Fear periods showed relatively stable win rates, indicating more cautious trading behavior.

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5. Key Insights

- Market sentiment has a strong impact on trading behavior
- Greed phases encourage excessive trading and reduce win rates
- Fear phases generate high volume but reward disciplined strategies
- Higher trading volume does not always result in better performance

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6. Trading Strategy Implications

- Traders should reduce leverage and avoid overtrading during Greed phases
- Fear periods require strict risk management but can offer strong opportunities
- Incorporating market sentiment into trading strategies can improve consistency
- Sentiment-based signals can help optimize risk exposure during volatile markets

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7. Conclusion

This analysis highlights how trader behavior and performance vary across different market sentiment conditions. Understanding these patterns can help traders make better decisions and manage risk more effectively. Overall, sentiment-aware trading strategies have the potential to improve long-term performance in volatile cryptocurrency markets.