📊 Trader Behavior vs Market Sentiment

Bitcoin Fear & Greed Index × Hyperliquid Trading Data

Candidate: Sumit
Role Applied: Data Science

1. Problem Statement

Financial markets are strongly influenced by trader psychology, particularly during periods of extreme **fear** and **greed**. While price movements reflect market outcomes, underlying **trader behavior**—such as risk-taking, leverage usage, and directional bias—often determines profitability.

This project aims to analyze how **market sentiment (Fear vs Greed)** impacts:

- Trader profitability

- Risk exposure

- Asset selection

- Directional performance

The ultimate goal is to uncover **actionable insights** that can inform smarter trading strategies in Web3 markets.

---

2. Datasets Overview

2.1 Bitcoin Market Sentiment Dataset

- **Source:** Fear & Greed Index

- **Key Columns:**

  - `Date`

  - `Classification` (Fear / Greed)

- Represents prevailing market psychology on a daily basis.

2.2 Hyperliquid Historical Trader Data

- Trade-level dataset capturing real trading behavior.

- **Key Columns:**
- Account, Coin, Side
- Execution Price, Size Tokens, Size USD
- Direction, Start Position
- Closed PnL
- Timestamp, Timestamp IST, date

---

3. Data Preparation

- Date fields were standardized and aligned.

- Trader data was merged with sentiment data on a **daily level**.

- Trades without sentiment information were excluded from sentiment-based analysis.

This ensured that each trade was evaluated within the correct **market sentiment context**.

---

4. Exploratory Analysis

4.1 Overall Trade Outcomes

- A baseline analysis showed a higher proportion of losing trades, which is expected in speculative and high-frequency trading environments.

- This establishes the importance of **timing, risk control, and sentiment awareness**.

(Figure: Overall Trade Outcome Distribution)

4.2 Asset-Level Profitability

- Profitability is highly **concentrated in a small subset of coins**.

- Similarly, losses are not uniformly distributed but cluster around specific assets.

(Figures: Top 5 Coins by Profit, Top 5 Coins by Loss)

Key takeaway: Asset selection plays a major role in trading outcomes.

---

5. Market Sentiment vs Profitability

5.1 Coin-Level Performance Across Sentiment

- Several coins show **strong sentiment sensitivity**, performing well in either Fear or Greed, but not both.

- Profitability is not consistent across sentiment regimes.

(Figure: Profit by Coin and Market Classification)

5.2 Downside Risk Analysis

- Maximum losses vary significantly across sentiment regimes.

- Certain assets experience **amplified losses during specific market conditions**.

(Figure: Maximum Loss by Coin and Market Classification)

---

6. Asset Case Studies

6.1 TRUMP Coin

- TRUMP demonstrates strong profitability under specific sentiment regimes.

- Performance varies sharply between Fear and Greed periods.

(Figure: TRUMP – Profit by Market Classification)

6.2 ONE7 Coin

- ONE7 exhibits persistent losses, particularly under certain sentiment conditions.

- Market psychology appears to exacerbate downside risk for this asset.

(Figure: ONE7 – Loss by Market Classification)

---

7. Directional & Behavioral Analysis

7.1 Directional Impact

- Profitability for many assets depends more on **trade direction (Long vs Short)** than the asset itself.

- Correct directional positioning significantly improves outcomes.

(Figure: Top Coin–Direction Combinations by PnL)

7.2 Direction × Sentiment Heatmap

- Clear interaction between **market sentiment and directional performance**.

- Certain sentiment regimes favor long strategies, while others favor short bias.

(Figure: Heatmap – Direction vs Market Sentiment)

---

8. Temporal Analysis

- The effect of sentiment on profitability is **not uniform across years**.

- Some years show strong sentiment-driven patterns, while others do not.

(Figure: Year-wise Profit and Loss by Market Sentiment)

Implication: Sentiment-based strategies should be applied selectively, depending on broader market regimes.

---

9. Key Insights & Strategy Implications

Key Insights

- Market sentiment significantly influences trader profitability and risk exposure.

- Profitable traders often behave **contrary to the crowd**, especially during Fear.

- Directional bias is more important than asset selection alone.

- Losses are sentiment-amplified rather than random.

Strategy Implications

- Reduce leverage during extreme sentiment phases.

- Adapt long/short bias based on sentiment regime.

- Focus on sentiment-sensitive assets for tactical trading.

- Apply sentiment-based strategies selectively, not universally.

---

10. Conclusion

This analysis demonstrates that **market sentiment is a critical driver of trader behavior**, affecting profitability, risk-taking, and directional decisions.

By incorporating sentiment-aware strategies and behavioral insights, traders can improve decision-making and manage downside risk more effectively in volatile Web3 markets.