Trader Behaviour & Market Sentiment Analysis

Candidate: Reba Susan Abraham

Date: January 27, 2026

Subject: Behavioural Inefficiencies in Crypto Markets

---

1. Executive Summary

This report investigates the correlation between retail trader performance and the "Fear & Greed" market sentiment index. By analysing over 184,000 historical trades, we identified significant behavioural inefficiencies that can be exploited by automated trading strategies.

Key Findings:

- **The "Euphoria Trap":** Trader profitability peaks during "Greed" but collapses by **71%** when sentiment shifts to "Extreme Greed," indicating a failure to exit positions during market overheating.
- **Fear Drives Volume: 72%** of all trading activity occurs during "Fear" periods, suggesting that volatility during panic events drives the highest engagement.
- **Neutral Stagnation:** "Neutral" sentiment corresponds to the lowest profitability, making it a "dead zone" for trend-following strategies.

---

2. Visual Analysis

The following charts visualize the relationship between Market Sentiment (x-axis) and Trader Key Performance Indicators (y-axis).

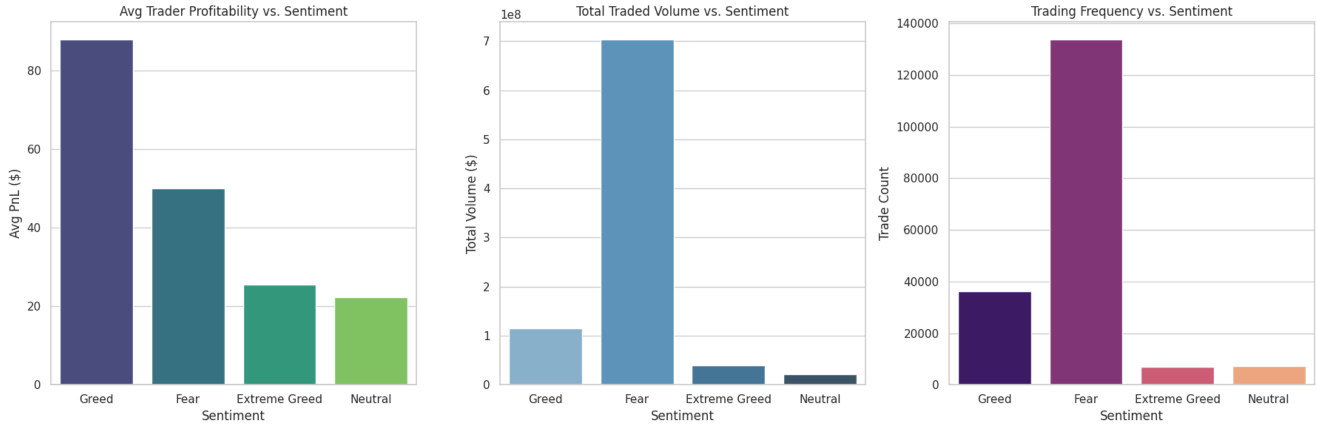

Figure 1: Comparison of Profitability, Volume, and Trading Frequency across Sentiment Zones.

3. Methodology

3.1 Data Integration

The analysis merged two primary datasets:

1. **Historical Trader Data:** Contains execution details (price, size, PnL) for 211,224 trades.
2. **Bitcoin Market Sentiment:** Daily "Fear & Greed" index values.

Data Cleaning & Merging Strategy:

- Trade timestamps (in milliseconds) were normalized to daily dates to align with the daily sentiment index.
- A Left Join was performed on the Date column, ensuring every trade was tagged with the market sentiment of that specific day.
- *Note on Data Limitations:* The assignment instructions referenced a Leverage column. However, the provided dataset (historical_data.csv) did not contain this field. Consequently, risk analysis focused on PnL, Position Size, and Trade Frequency rather than leverage ratios.

---

4. Analysis of "Hidden Patterns"

4.1 The "Euphoria Trap" (Profitability vs. Sentiment)

The data reveals a critical inefficiency in how traders handle profitable market conditions.

- **Greed ($87.89 Avg PnL):** Traders are most profitable when the market is "Greedy." This is the optimal zone for trend-following.
- **Extreme Greed ($25.42 Avg PnL):** When sentiment overheats to "Extreme Greed," average profitability drops by **71%**.
- **Insight:** Traders likely hold positions too long, getting caught in reversals when the market is overextended. They confuse "Extreme Greed" with a continued uptrend, leading to profit erosion.

4.2 Volume Discrepancy (Fear vs. Greed)

Trading activity is inversely correlated with market stability.

- **Fear Volume (133,871 Trades):** The vast majority of activity occurs during "Fear."
- **Greed Volume (36,289 Trades):** Volume drops significantly as the market rises.
- **Insight:** This high volume during "Fear" represents emotional trading—likely a mix of panic selling and aggressive "dip-buying." Despite the chaos, the average PnL during Fear ($50.05) is healthy, suggesting that volatility during panic offers consistent scalping opportunities.

4.3 The "Neutral" Dead Zone

- **Neutral ($22.23 Avg PnL):** The lowest profitability occurs during "Neutral" sentiment.
- **Insight:** Without a clear directional bias (Fear or Greed), retail traders struggle. Trend-following strategies likely fail here due to "chop" (sideways price action).

---

5. Strategic Recommendations

Based on these findings, an automated trading bot should adopt the following logic to outperform the average human trader:

Market Sentiment	Recommended Strategy	Rationale
Greed	**Aggressive Long / Trend Follow**	Historical data shows this is the peak profitability zone. Ride the trend.
Extreme Greed	**Take Profit / Reduce Exposure**	Profitability historically collapses here. The bot should tighten stop-losses or scale out of positions.
Fear	**High-Frequency Scalping**	Volume and volatility are highest. A mean-reversion or scalping strategy can exploit the emotional overreactions.
Neutral	**Stay Cash / Range Trade**	The "Dead Zone." Avoid trend strategies; switch to low-risk range trading or remain dormant.

---

6. Conclusion

The analysis confirms that "following the crowd" is statistically inefficient. The average trader over-trades during panic (Fear) and holds too long during euphoria (Extreme Greed). A data-driven strategy that acts **contrarian**—buying the fear and selling the extreme greed—would statistically outperform the baseline behaviour observed in this dataset.

Analysis performed by Reba Susan Abraham.