📊Impact of Market Sentiment on Trader Performance in Cryptocurrency Markets

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INSIGHTS OF THE PROJECT ARE AS FOLLOWING:

After a long data preprocessing step that insights which I got were :

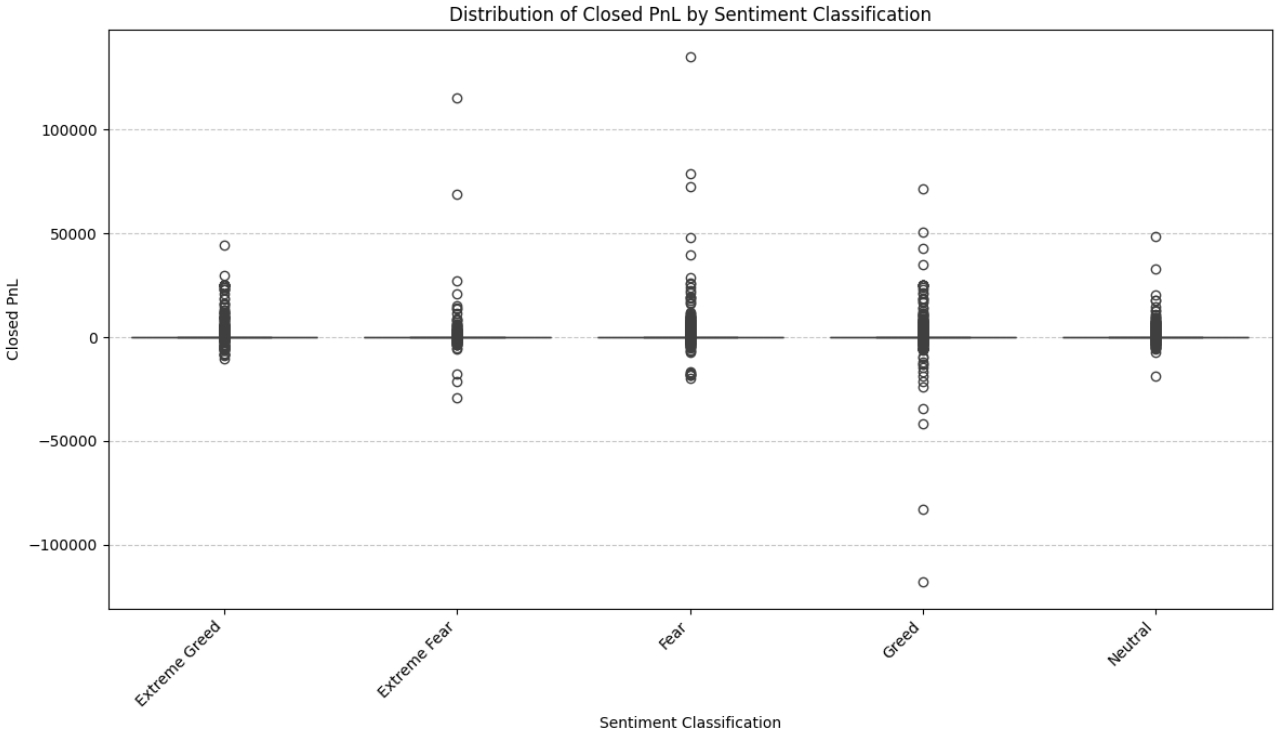

Figure Description – Distribution of Closed PnL by Market Sentiment

This figure illustrates the distribution of **Closed Profit and Loss (PnL)** across different **market sentiment classifications**: *Extreme Greed*, *Extreme Fear*, *Fear*, *Greed*, and *Neutral*. Each category displays individual trade outcomes, showing how trader profitability varies under different psychological states of the market.

Key observations from the plot:

- **High variability across all sentiments:** Every sentiment category exhibits a wide spread of PnL values, indicating that both profits and losses occur regardless of market sentiment.
- **Fear and Extreme Fear show higher dispersion:** These periods display some of the **largest positive and negative outliers**, suggesting increased volatility and risk-taking behavior when the market is fearful.
- **Greed periods show notable downside risk:** Although Greed phases include profitable trades, they also contain some **extreme losses**, implying possible overconfidence and aggressive positioning by traders.
- **Neutral sentiment appears relatively stable:** Compared to Fear and Greed, the Neutral category shows comparatively **lower volatility**, with fewer extreme PnL outliers.
- **Presence of extreme outliers:** Large positive and negative PnL values across sentiments highlight the impact of leverage, position sizing, and market volatility on trader outcomes.

Overall, the visualization suggests that **market sentiment strongly influences the risk profile of trading outcomes**, with emotionally charged conditions (Fear and Greed) associated with more extreme profitability and losses, while Neutral sentiment corresponds to more controlled trading behavior.

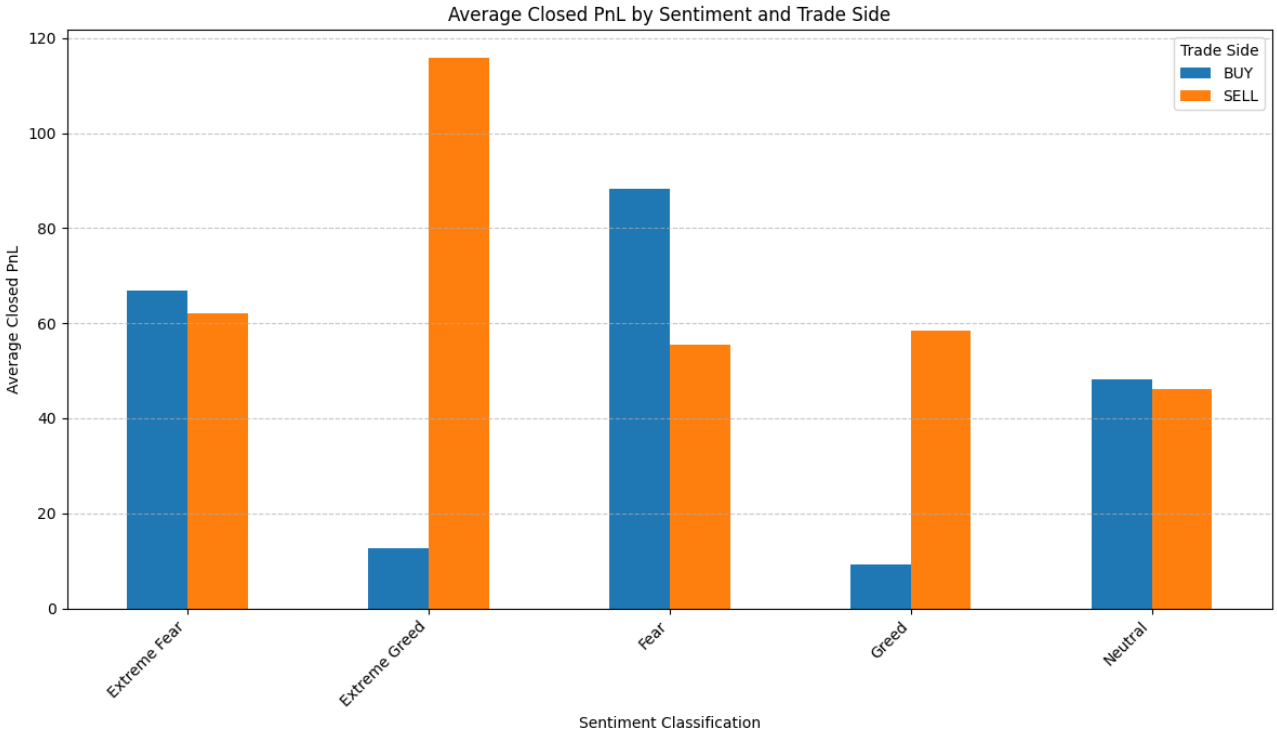

Figure Description – Average Closed PnL by Market Sentiment and Trade Side

This bar chart presents the **average Closed Profit and Loss (PnL)** segmented by **market sentiment classification** (*Extreme Fear, Extreme Greed, Fear, Greed,* and *Neutral*) and further divided by **trade side** (*BUY* vs *SELL*). The visualization highlights how both sentiment and trading direction influence average profitability.

Key insights from the figure:

- **Extreme Greed favors SELL positions:** During Extreme Greed periods, **SELL trades generate significantly higher average PnL** compared to BUY trades, suggesting that contrarian or profit-taking strategies perform better when the market is overly optimistic.
- **Fear conditions favor BUY positions:** In Fear and Extreme Fear scenarios, **BUY trades show higher average PnL** than SELL trades, indicating that traders benefit from entering long positions during market pessimism, potentially capturing rebounds or mean reversion.
- **Greed shows moderate SELL advantage:** Under Greed sentiment, SELL trades continue to outperform BUY trades on average, reinforcing the idea that markets in optimistic phases may be prone to corrections.
- **Neutral sentiment shows balanced performance:** When sentiment is Neutral, both BUY and SELL trades exhibit relatively similar average PnL, reflecting more stable and less emotionally driven market conditions.
- **Clear interaction between sentiment and trade direction:** The contrast between BUY and SELL performance across sentiments demonstrates that **aligning trade direction with market psychology can significantly impact profitability**.

Overall, the chart suggests that **adaptive trading strategies based on market sentiment—such as buying during fear and selling during greed—tend to yield better average outcomes**, reinforcing the importance of sentiment-aware decision-making in cryptocurrency trading.

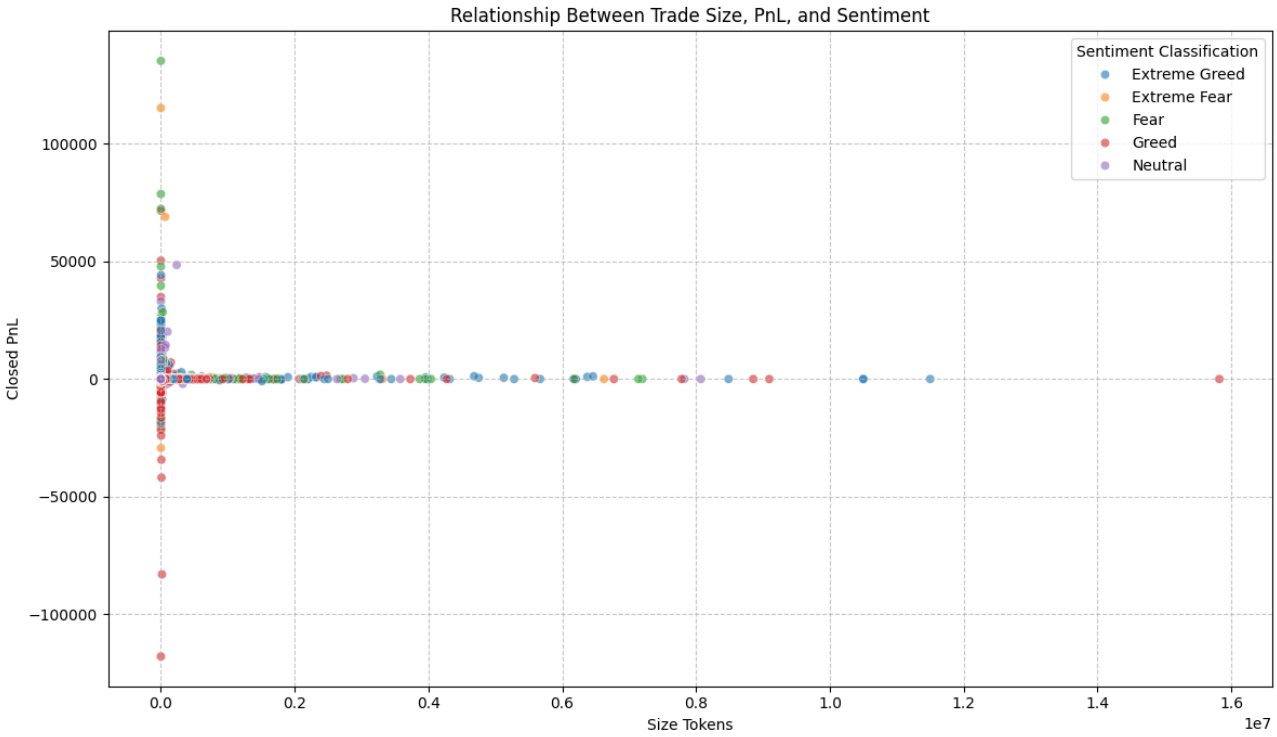

Figure Description – Relationship Between Trade Size, Closed PnL, and Market Sentiment

This scatter plot visualizes the relationship between **trade size (Size Tokens)** and **Closed Profit and Loss (PnL)** across different **market sentiment classifications** (*Extreme Greed, Extreme Fear,*

Fear, Greed, and *Neutral*). Each point represents an individual trade, with color indicating the prevailing market sentiment at the time of execution.

Key insights derived from the visualization:

- **High PnL variability at smaller trade sizes:** The majority of extreme profits and losses occur at **relatively small trade sizes**, indicating that factors such as leverage, timing, and volatility play a stronger role than trade size alone in determining outcomes.
- **Diminishing PnL dispersion with increasing size:** As trade size increases, PnL values tend to **cluster closer to zero**, suggesting more controlled risk management or institutional-style trading behavior for larger positions.
- **Sentiment-driven extremes:** Fear and Extreme Fear periods exhibit some of the **largest positive and negative PnL outliers**, reflecting heightened volatility and emotional trading during uncertain market conditions.
- **Greed-associated downside risk:** Trades executed during Greed phases show notable negative outliers, implying overconfidence and aggressive positioning can lead to significant losses.
- **No strong linear relationship:** The absence of a clear upward or downward trend indicates that **trade size alone does not predict profitability**, reinforcing the importance of sentiment and execution strategy.

Overall, the figure demonstrates that **market sentiment significantly influences the risk distribution of trading outcomes**, while trade size has a limited direct correlation with profitability. Effective trading performance appears to depend more on sentiment-aware strategies and risk control than on position size alone.

Overall Insight Description

The combined visual analysis demonstrates that **market sentiment plays a crucial role in shaping trader profitability, risk exposure, and performance variability in cryptocurrency markets**. Across all sentiment regimes, trading outcomes show significant dispersion, indicating that profits and losses are possible under any market condition. However, emotionally charged environments—particularly **Fear, Extreme Fear, and Greed**—are associated with **higher volatility and more extreme PnL outcomes**, reflecting increased uncertainty, aggressive positioning, and behavioral biases such as panic selling or overconfidence.

The comparison of **BUY vs SELL performance** reveals a clear behavioral pattern: **BUY trades tend to perform better during Fear-driven markets**, while **SELL trades outperform during Greed-driven phases**, supporting the effectiveness of contrarian strategies aligned with market psychology. Neutral sentiment periods, in contrast, exhibit more balanced and stable outcomes, suggesting reduced emotional influence and disciplined trading behavior.

Additionally, the relationship between **trade size and PnL** shows that profitability is **not directly dependent on position size**. Large profits and losses frequently occur at smaller trade sizes, highlighting the influence of leverage, timing, and sentiment-driven decision-making over sheer capital allocation. Larger trades generally display more controlled PnL distributions, indicating stronger risk management practices.

Overall, these insights emphasize that **sentiment-aware trading strategies, combined with disciplined risk management, are more impactful than trade size alone**. Understanding and adapting to market psychology can significantly enhance trading performance while reducing exposure to extreme losses in volatile market conditions.