DS_assignment

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Executive Summary: Market Sentiment and Trader Profitability Analysis

High-Level Finding: The Weak Aggregate Correlation

Analysis of trading data spanning from January 2023 to May 2025 reveals a surprisingly weak correlation between daily market sentiment—measured across the fear-greed spectrum—and aggregate trader profitability. While intuition might suggest that periods of market greed should coincide with profitable trading and fearful markets with losses, the cumulative profit and loss (PnL) data demonstrates that sentiment alone is a poor predictor of overall market performance. All sentiment classifications converge toward similar cumulative PnL outcomes over the long term, suggesting that market sentiment operates as only one factor among many in determining trading success.

Main Discovery: The Whale-Retail Divergence

This seemingly paradoxical weak aggregate correlation masks a profound divergence in trading behavior and outcomes when traders are segmented by volume. The data reveals two distinct trader populations with fundamentally opposing relationships to market sentiment: high-volume traders ("Whales") and low-volume traders ("Retail"). These two groups exhibit starkly contrasting patterns of profitability relative to sentiment, indicating that a one-size-fits-all analysis obscures critical behavioral insights about market participants.

The Divergence in Detail

Whale Traders: Sentiment as a Profit Opportunity

High-volume traders demonstrate a positive relationship between market sentiment and profitability. These traders appear to possess the skill, capital, and information advantages necessary to trade skillfully in alignment with or contrary to prevailing sentiment. Rather than being swept along by market emotion, whales utilize sentiment as a trading signal. They may trade with the herd during rational exuberance or position contrarian trades when fear reaches extremes. Their consistent profitability across sentiment cycles suggests they possess either superior market timing abilities, deeper information sets, or sufficient capital to absorb temporary drawdowns while waiting for sentiment-driven mispricing to correct. The distribution of their trade sizes remains concentrated at low relative volumes, yet their aggregate contribution to PnL grows steadily, indicating quality over quantity in their trading approach.

Retail Traders: The Herding Problem

In stark contrast, retail traders exhibit a negative relationship between market sentiment and profitability, with particularly severe losses occurring during periods of elevated greed. This pattern is consistent with herding behavior and momentum-chasing dynamics. As greed increases and markets approach tops, retail traders tend to enter positions, subsequently experiencing losses as prices revert or decline. The distribution analysis shows that retail traders cluster around very small relative trade sizes, yet paradoxically this does not protect them from losses. Rather, their attempts to participate in rallies characterized by high greed sentiment often coincide with market corrections, leaving them on the wrong side of trades. This suggests that retail traders lack either the timing acumen or the conviction to avoid euphoric entry points.

Risk Dynamics: Volatility and Extreme Sentiment

The trading volume heatmap reveals a critical insight into risk behavior: both extreme fear and extreme greed periods coincide with elevated trading activity and market volatility. During phases of extreme sentiment—whether panic selling or exuberant buying—market participants dramatically increase position sizes and trading frequency. This amplified risk-taking during emotional extremes creates a vicious cycle: heightened volatility during sentiment extremes makes these periods particularly dangerous for unprepared traders, yet the allure of potential profits during volatile markets paradoxically attracts greater participation. The heatmap demonstrates that extreme fear and extreme greed events, though opposite in nature, are remarkably similar in their propensity to generate elevated trading volumes and risk exposure. This symmetry suggests that extreme emotions—regardless of direction—override rational risk assessment and lead to concentrated trading during precisely the periods when markets are most unstable.

Conclusion

The apparent weakness in aggregate sentiment-to-PnL correlation dissolves when trader heterogeneity is acknowledged. Whales trade sentiment skillfully to generate returns; retail traders are victimized by it. Risk concentrates at the extremes of emotional sentiment, creating dangerous conditions that affect all market participants but disproportionately harm those with limited resources and experience. These findings underscore the necessity of trader segmentation in behavioral finance analysis and highlight the persistent profitability advantage of sophisticated market participants over retail participants.