Final Summarized Insights & Explanations

1. Trading Volume vs. Sentiment

- **Observation:** Trading volume tends to **increase during "Greed" periods** compared to "Fear" periods.
- **Explanation:** When market sentiment shifts to greed, traders may feel confident in taking larger positions, expecting further price gains.
- **Strategic Note:** This confidence-driven volume increase could signal momentum opportunities, but also higher risk of over-leverage.

2. Profitability Trends

- **Observation: Average Closed PnL** is generally **positive during greed** and **negative or volatile during fear**.
- **Explanation:** In greed phases, market trends are clearer and upward, aiding profitable trades. Fear phases are often marked by sharp reversals, trapping long positions.
- **Strategic Note:** Consider reducing position size or using tighter stop-loss during fear periods to preserve capital.

3. Risk & Leverage

- **Observation: Leverage usage spikes during greed** and occasionally during extreme fear (likely "revenge trades" after losses).
- **Explanation:** Overconfidence in greed phases leads to aggressive leverage; in extreme fear, desperation can trigger risky, high-leverage attempts to recover losses.
- **Strategic Note:** Track leverage patterns as an early warning — sustained high leverage across the market could signal an approaching correction.

4. Correlation Insights

- **Observation:** Rolling correlation heatmaps show:
    - PnL correlates **positively with sentiment** (better performance in greed).
    - Leverage correlates with sentiment but not always with profitability — high leverage does not guarantee higher returns.
- **Strategic Note:** Focus on sentiment-aligned strategies rather than purely leverage-based ones.

5. Hidden Signals

- **Observation:** Before sentiment switches (Fear → Greed or vice versa), **trading volume and PnL volatility** tend to increase 1–2 days in advance.
- **Explanation:** Traders may be anticipating sentiment change based on price action before it's reflected in sentiment indexes.
- **Strategic Note:** Monitoring these pre-shift spikes could help time entries ahead of sentiment-driven moves.

✅ Overall Takeaway:

- **Greed phases** = higher volume, higher leverage, better average PnL — but also higher risk of rapid reversals.
- **Fear phases** = reduced profitability, more volatility, occasional desperate leverage spikes — caution is advised.
- **Best Strategy:** Trade with sentiment trends but use position sizing & risk controls, especially during sentiment transitions.