Regression Modeling: A Data Driven Approach to Extracting Insights from Sentiment Analysis and Stock Market Returns

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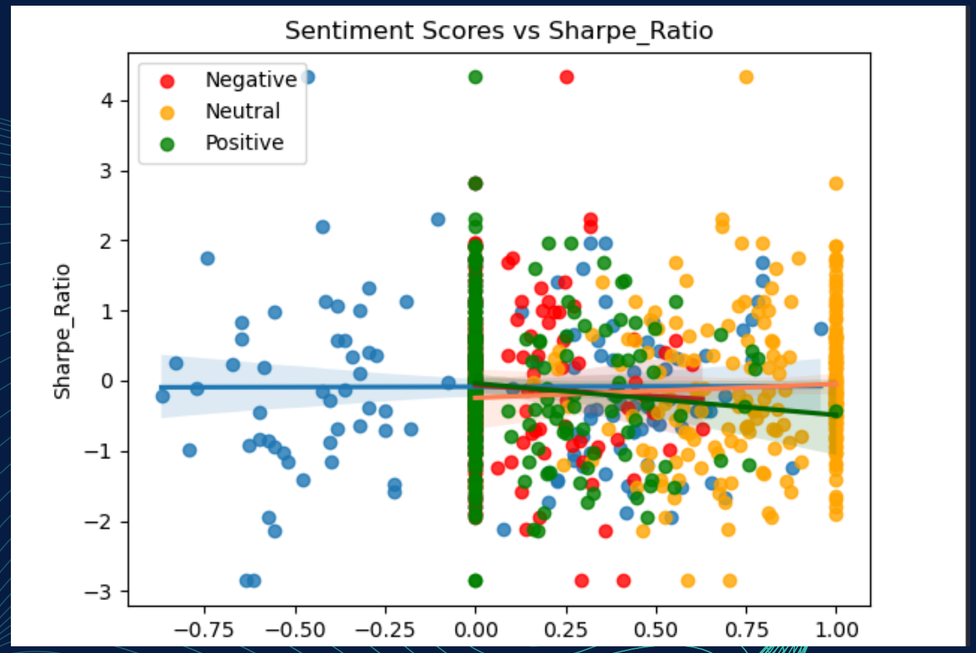
Research question: Is there a correlation between public sentiment, volatility, and risk adjusted returns?

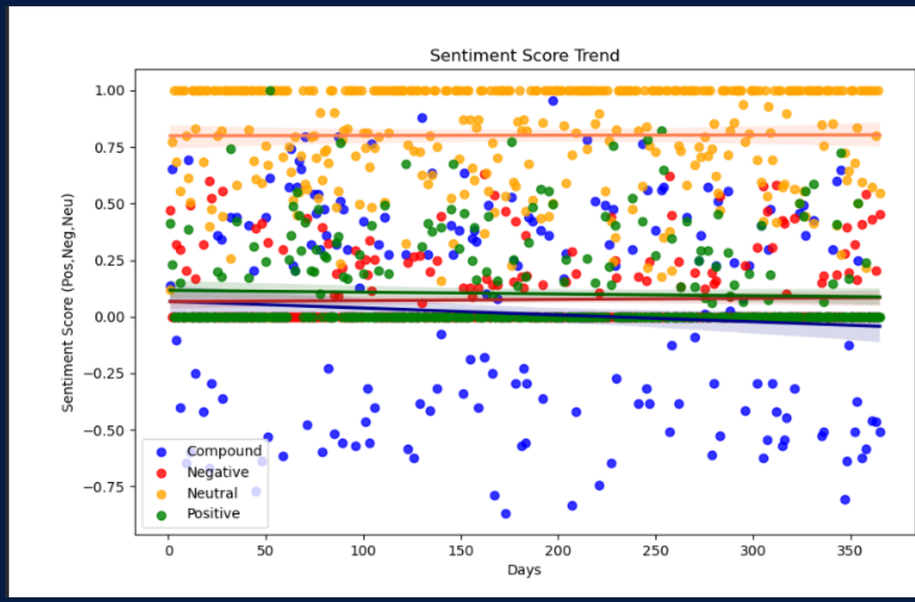
Null Hypotheiss : There is not a statistically significant correlation between expressed sentiment and market returns/sharpe ratio
Alternative Hypothesis: There is a statistically significant correlation between expressed sentiment and market returns/sharpe ratio

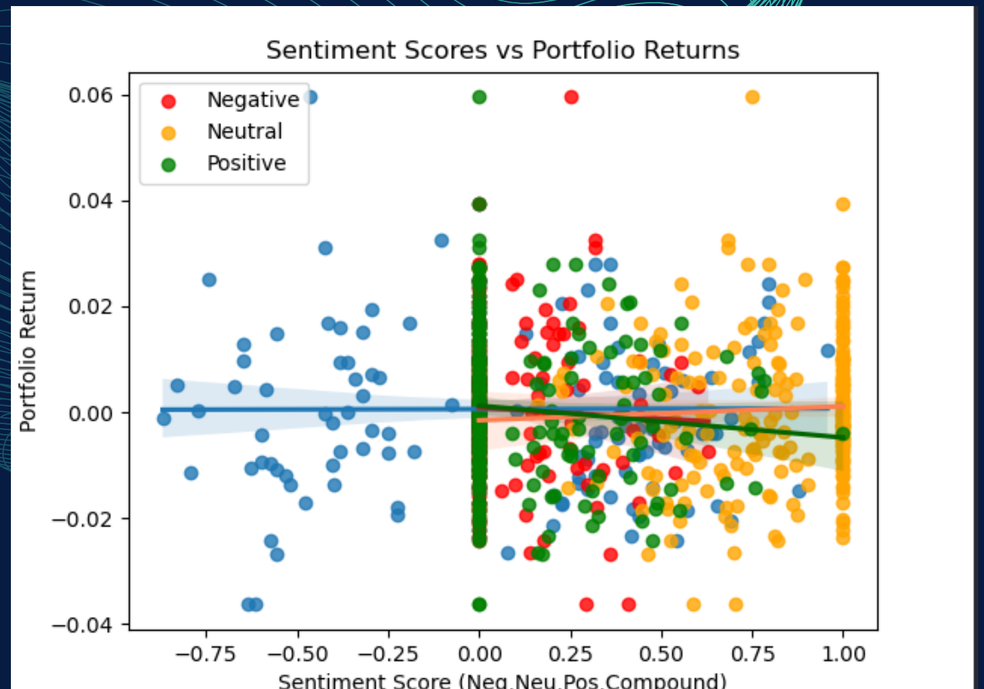
Null Hypothesis : There is not a statistically significant correlation between expressed sentiment and time.
Alternative Hypothesis: There is a statistically significant correlation between expressed sentiment and time.

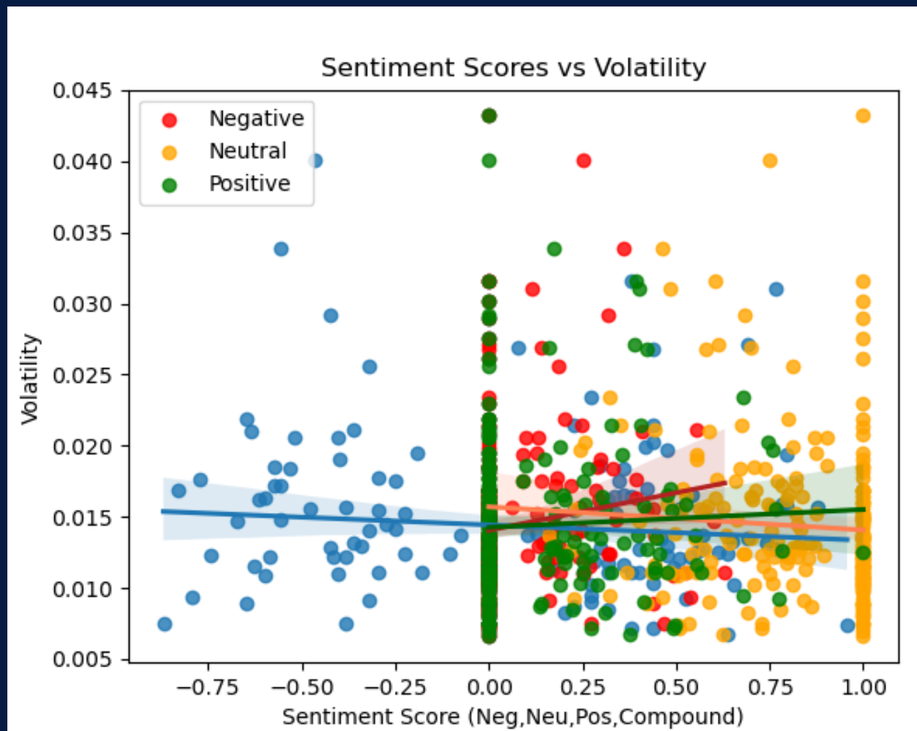
Null Hypothesis : There is not a statistically significant correlation between expressed sentiment and volatility.
Alternative Hypothesis: There is a statistically significant correlation between expressed sentiment and volatility.

Results


Sentiment Scores vs Sharpe_Ratio
Negative
Neutral
Positive
Sharpe_Ratio


Sentiment Score Trend
Compound
Negative
Neutral
Positive
Sentiment Score (Pos,Neg,Neu)
Days


Sentiment Scores vs Portfolio Returns
Negative
Neutral
Positive
Portfolio Return
Sentiment Score (Neg,Neu,Pos,Compound)


Sentiment Scores vs Volatility
Negative
Neutral
Positive
Volatility
Sentiment Score (Neg,Neu,Pos,Compound)

Conclusions

- There aren't any statistically significant correlations between expressed sentiment on Wall Street Bets and risk adjust returns.
- However there is a statistically significant increase in volatility when more negative sentiment is expressed in Wall Street Bets.
- Since the p-value is .043<.05 this means we will reject the null hypothesis and accept the alternative that there is a correlation between negative sentiment expressed and increased levels of volatility within the market.

Results for Sentiment vs Time:

- P-Value Pos: 0.4030400843624842 There is not a significant correlation between Portfolio_Return and Positive sentiment scores
- P-Value Neu: 0.9308111406502669 There is not a significant correlation between neutral sentiment scores and Portfolio_Return.
- P-Value Neg: 0.520356043179645 There is not a significant correlation between negative sentiment scores and Portfolio_Return.

Results for Sentiment vs Returns:

- P-Value Pos: 0.16832724870682353 There is not a significant correlation between Portfolio_Return and Positive sentiment scores
- P-Value Neu: 0.4332210806574682 There is not a significant correlation between neutral sentiment scores and Portfolio_Return.
- P-Value Neg: 0.5141758786408769 There is not a significant correlation between negative sentiment scores and Portfolio_Return.

Results for Sentiment vs Sharpe Ratio:

- P-Value Pos: 0.16832724870682353 There is not a significant correlation between Sharpe_Ratio and Positive sentiment scores
- P-Value Neu: 0.4332210806574682 There is not a significant correlation between neutral sentiment scores and Sharpe_Ratio.
- P-Value Neg: 0.5141758786408769 There is not a significant correlation between negative sentiment scores and Sharpe_Ratio.

Results for Sentiment vs Volatility:

- P-Value Pos: 0.4898319543887323 There is not a significant correlation between volatility and Positive sentiment scores
- P-Value Neu: 0.24152772543470266 There is not a significant correlation between neutral sentiment scores and volatility.
- P-Value Neg: 0.04310127995349184 There is a significant correlation between negative sentiment scores and volatility.