

# Final Report: Influence of BTC & SOL on Meme Coin Market

## 1. Correlation Analysis

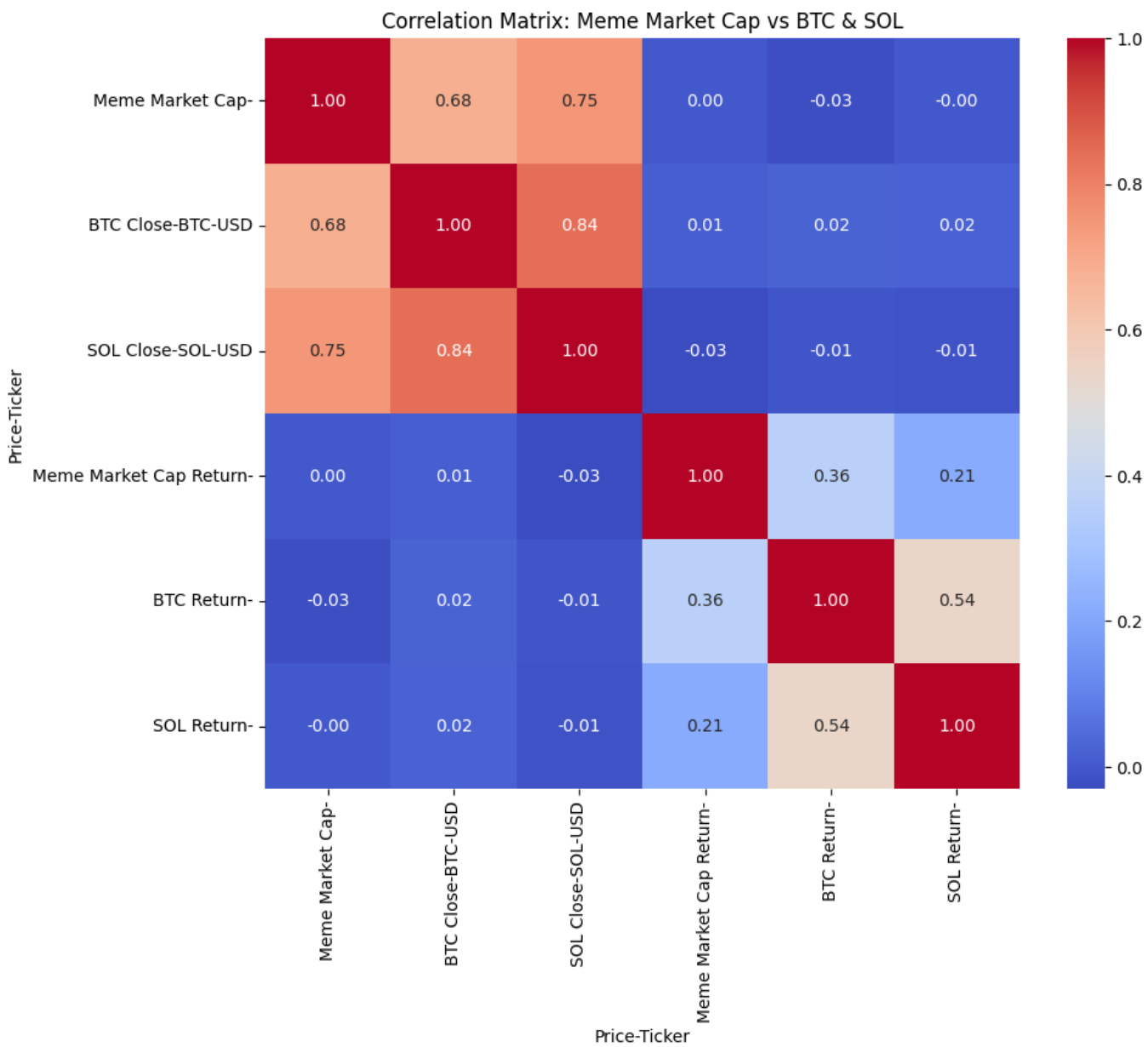


Figure 1: Correlation matrix of BTC, SOL, DOGE, and SHIB

## 2. Price and Returns Overview

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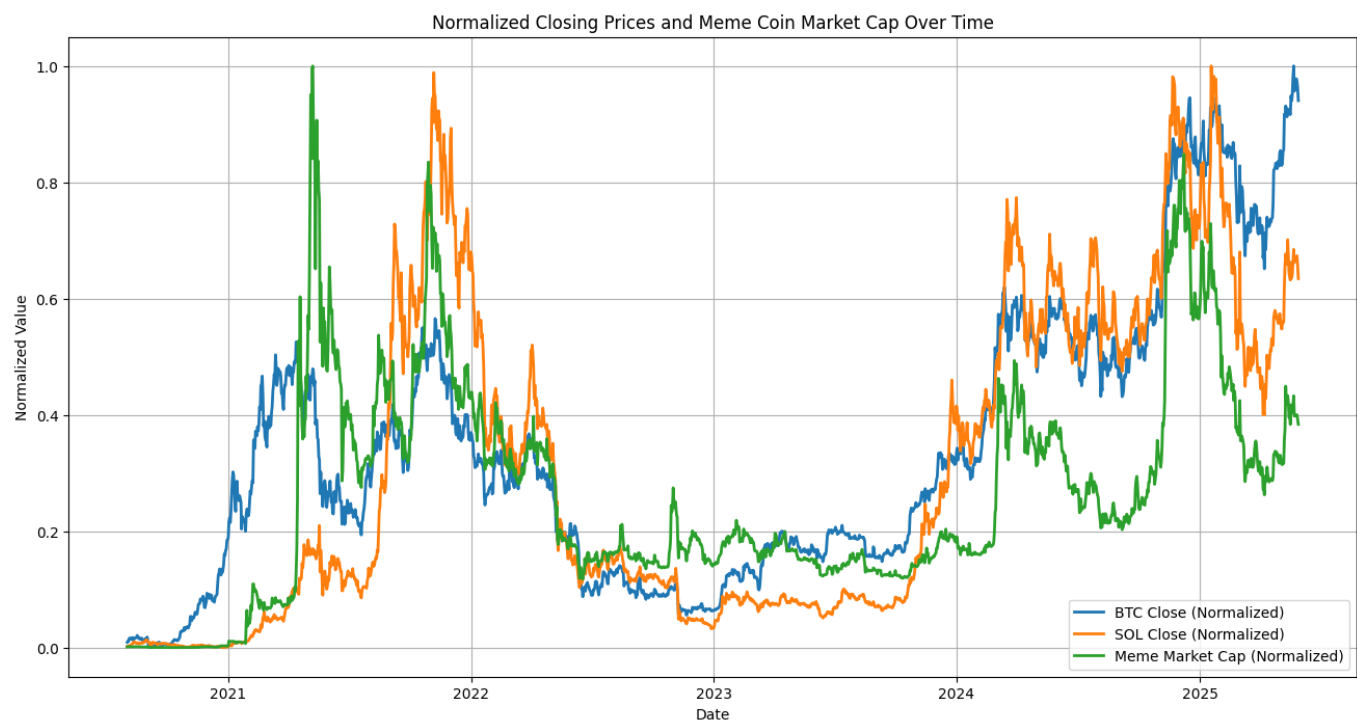


Figure 2: Normalized price comparison (2020-2025)

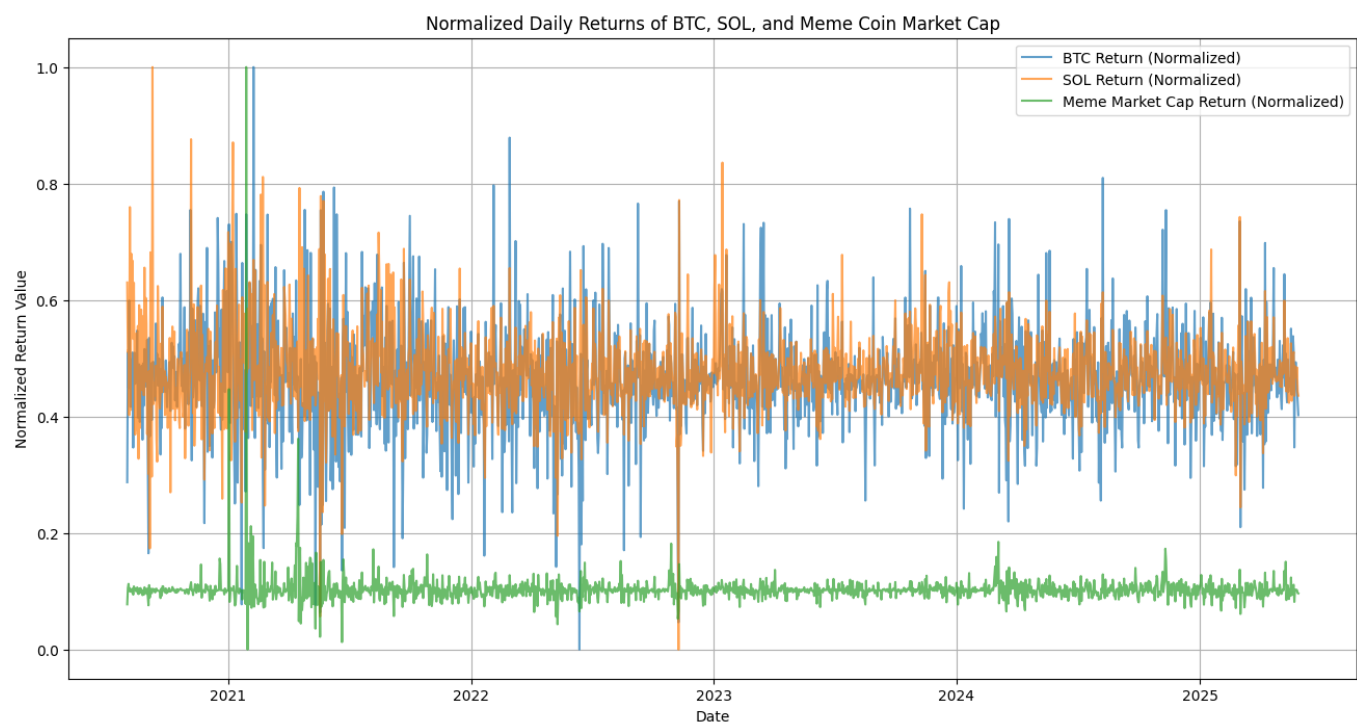


Figure 3: Daily returns of BTC, SOL, and meme coin market cap

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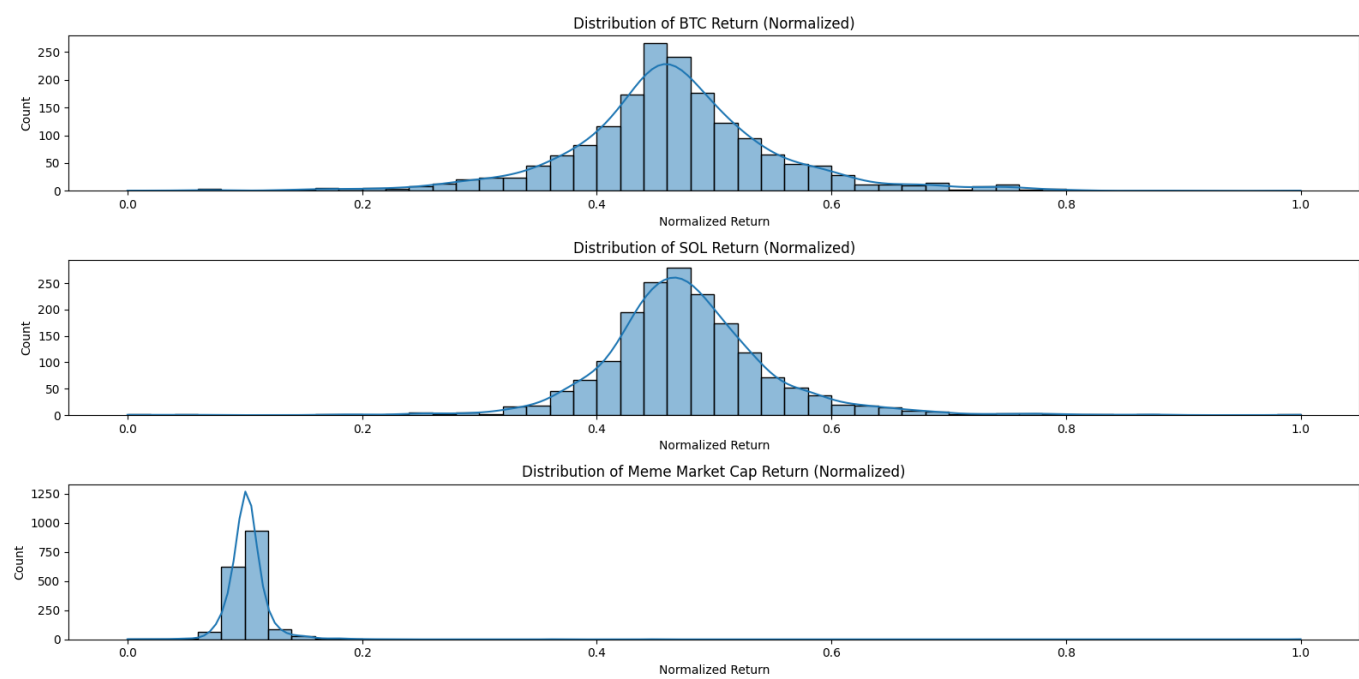


Figure 4: Histogram of normalized returns

## 3. Rolling Correlation

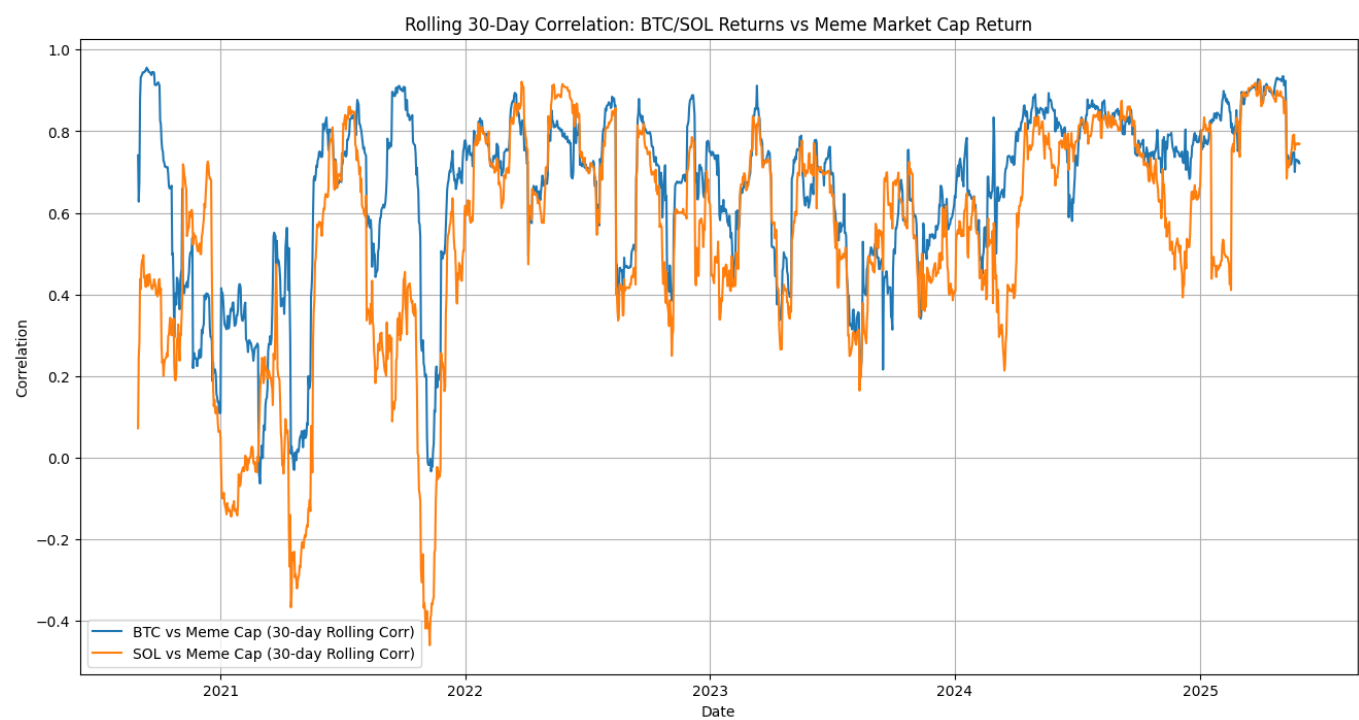


Figure 5: 30-day rolling correlation (BTC/SOL vs meme coins)

## 4. Regression Analysis Diagnostics

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Figure 6: Scatter plots with regression trends

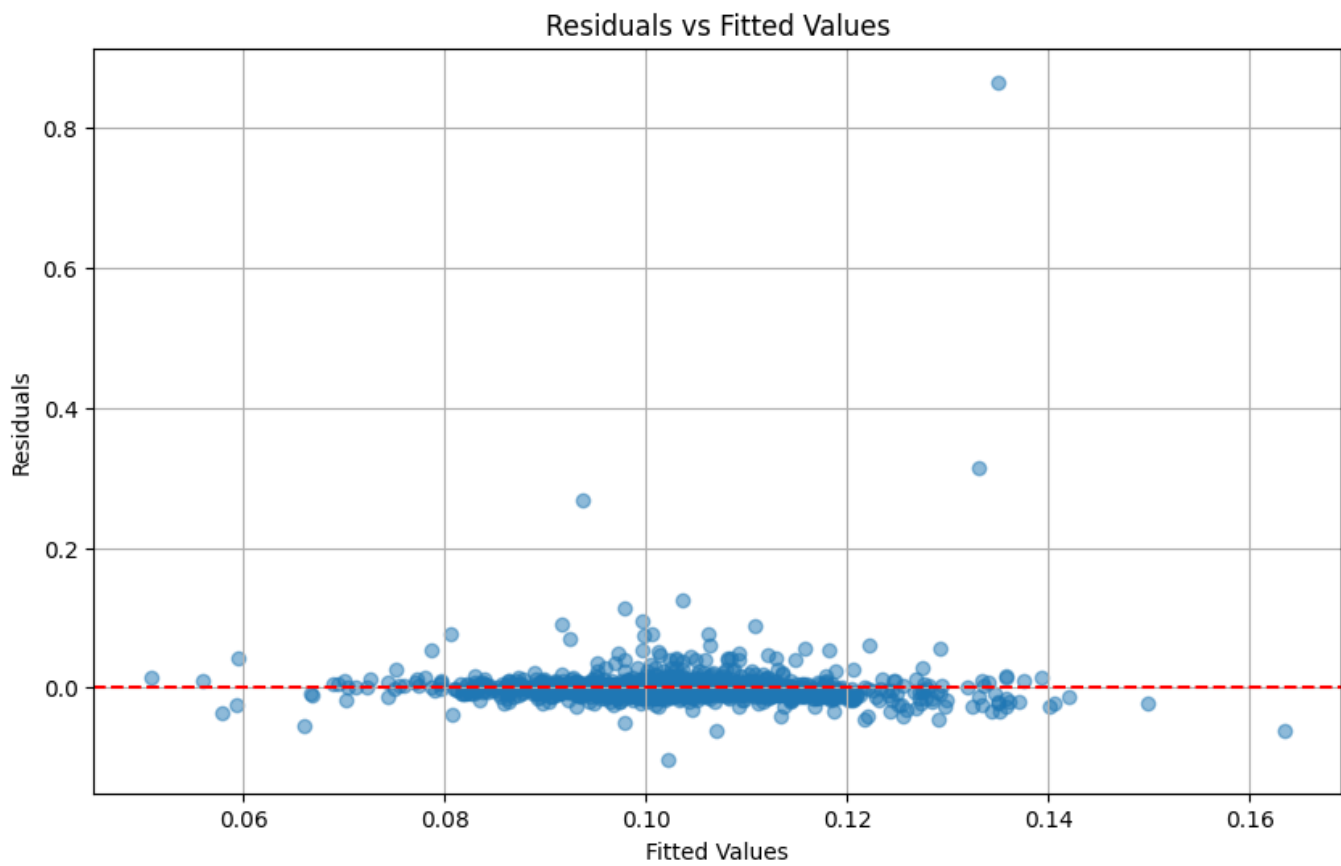


Figure 7: Residual analysis - Hypothesis 1 (BTC)

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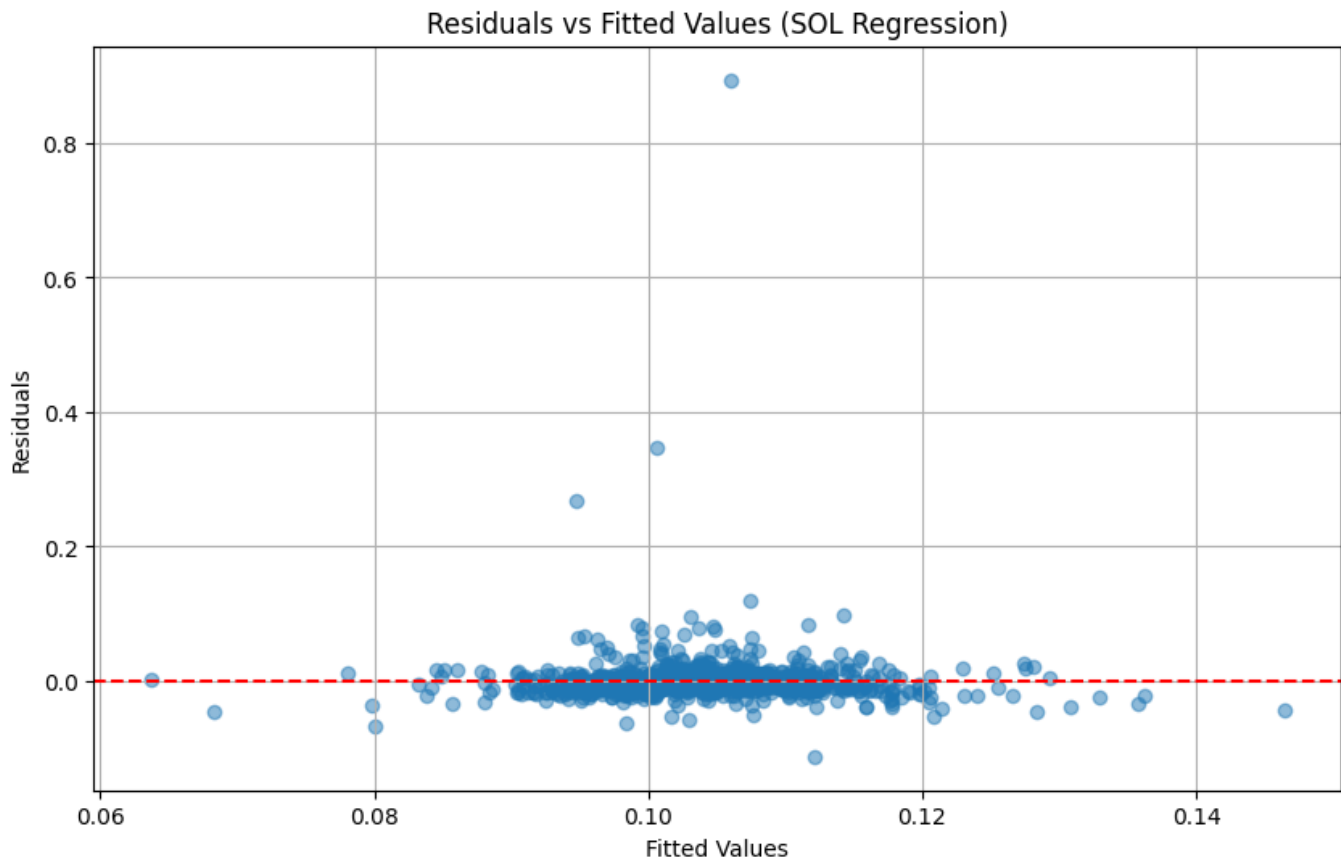
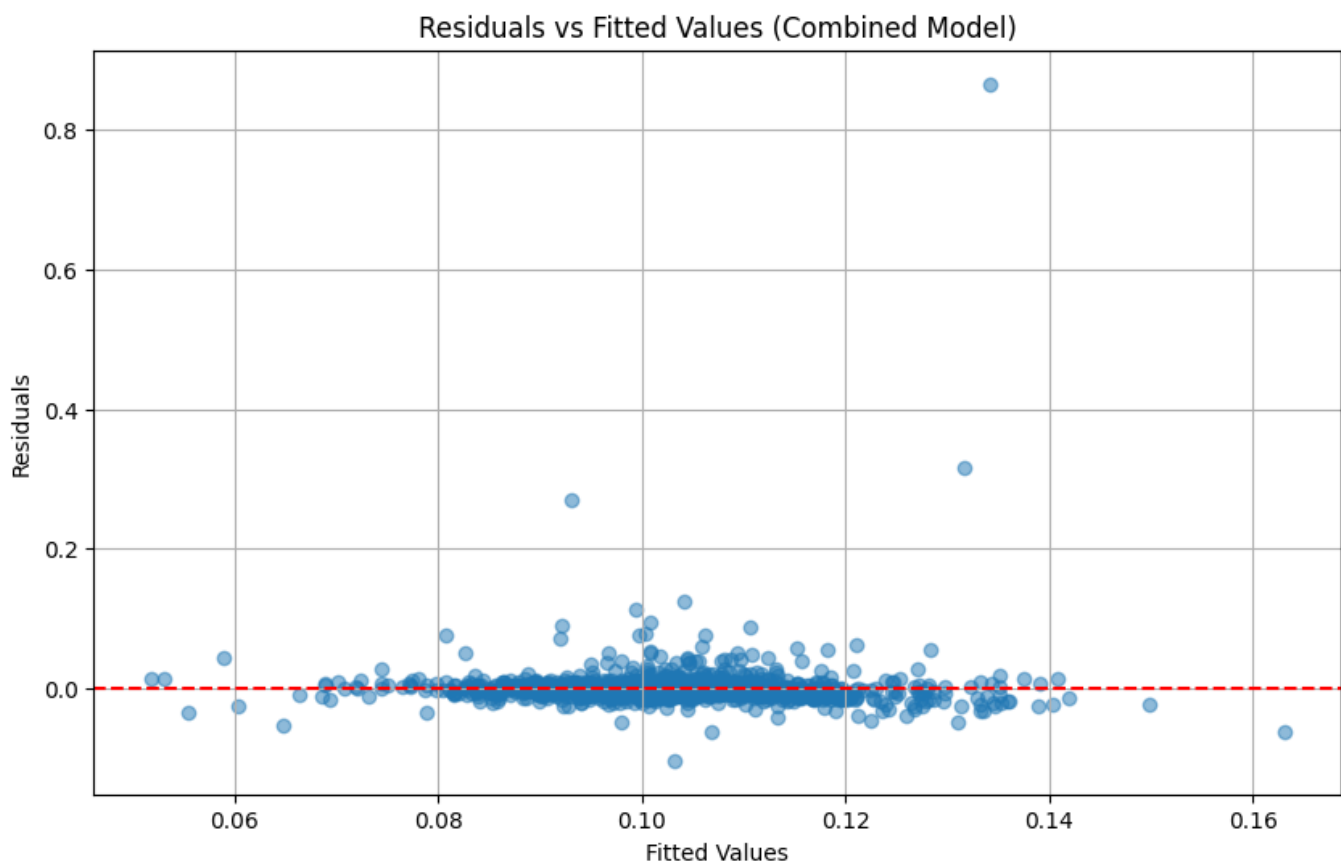


Figure 8: Residual analysis - Hypothesis 2 (SOL)



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Figure 9: Residual analysis - Hypothesis 3 (Combined)

## 5. Machine Learning Interpretability and Performance

Decision Tree: BTC Return → Meme Market Cap Return (Depth=3)

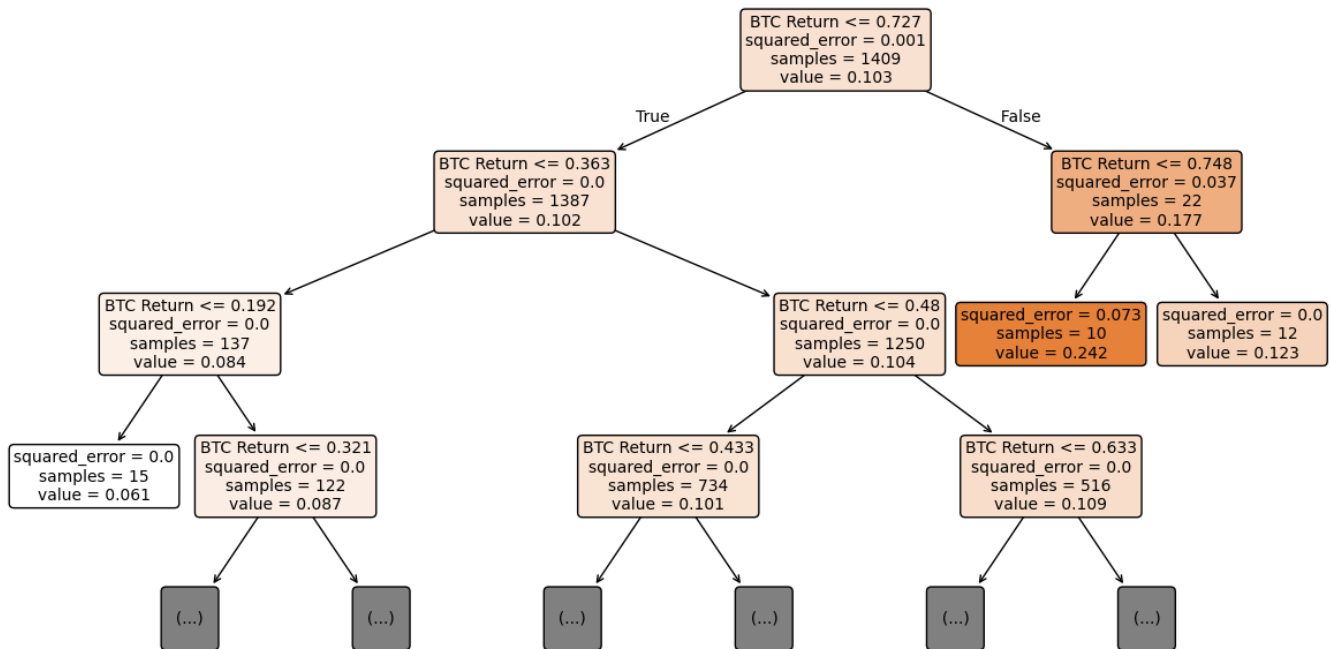


Figure 10: Decision Tree structure - BTC influence

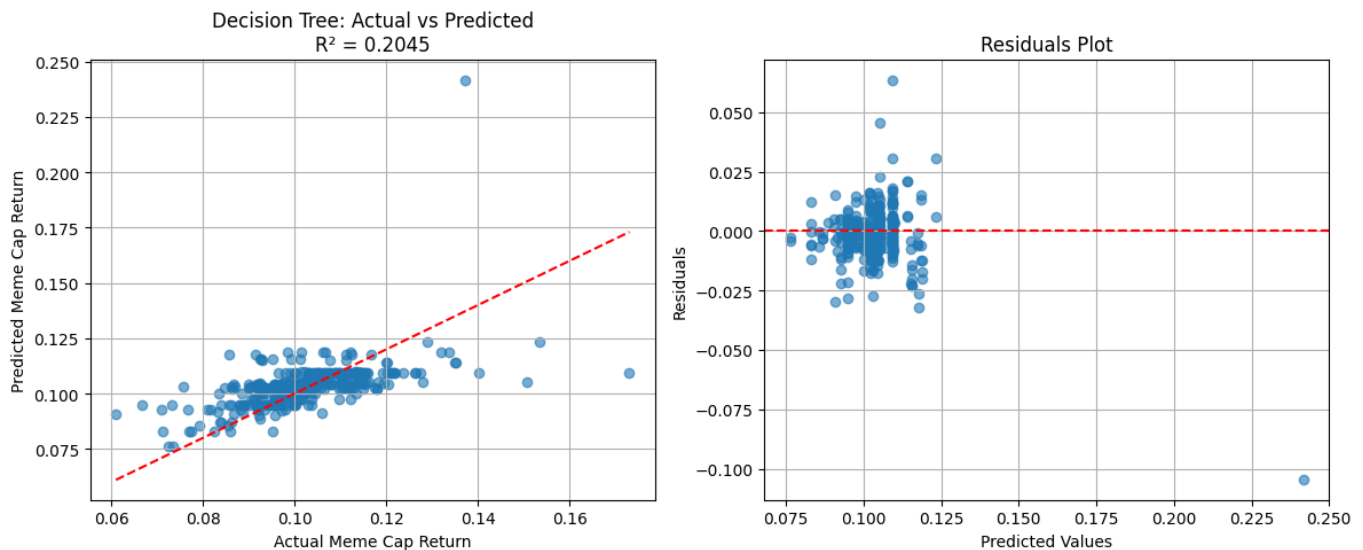


Figure 11: Decision Tree results - predicted vs actual

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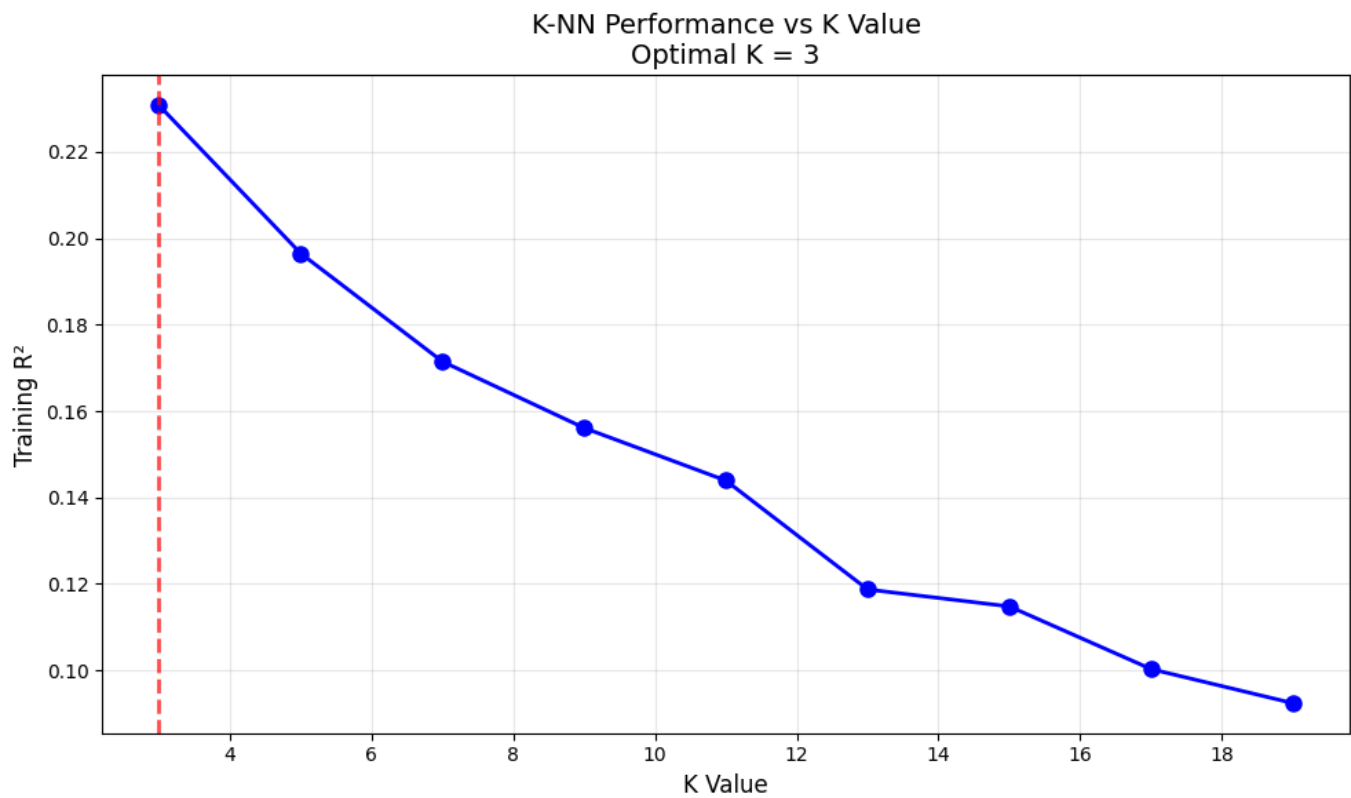


Figure 12: K-NN model performance - k-value selection

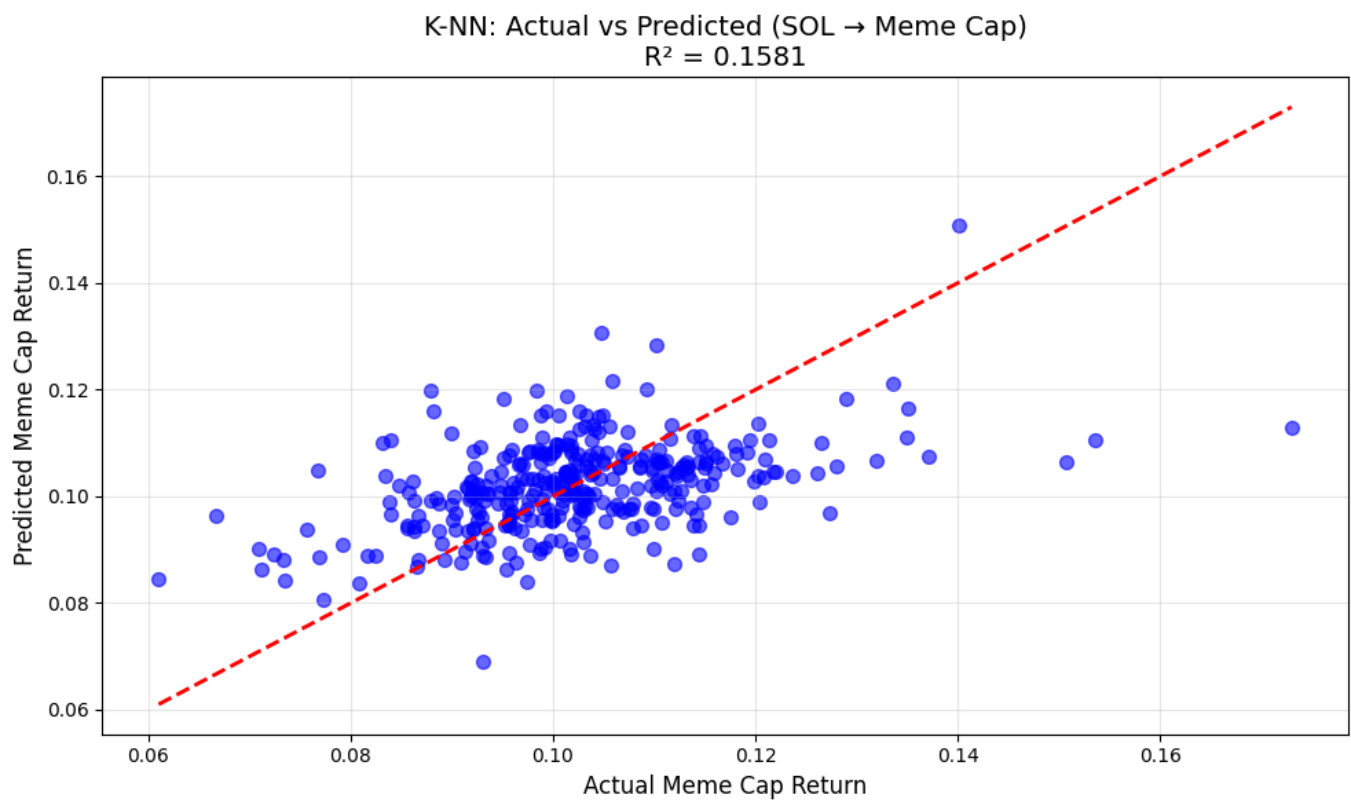


Figure 13: K-NN results - prediction performance

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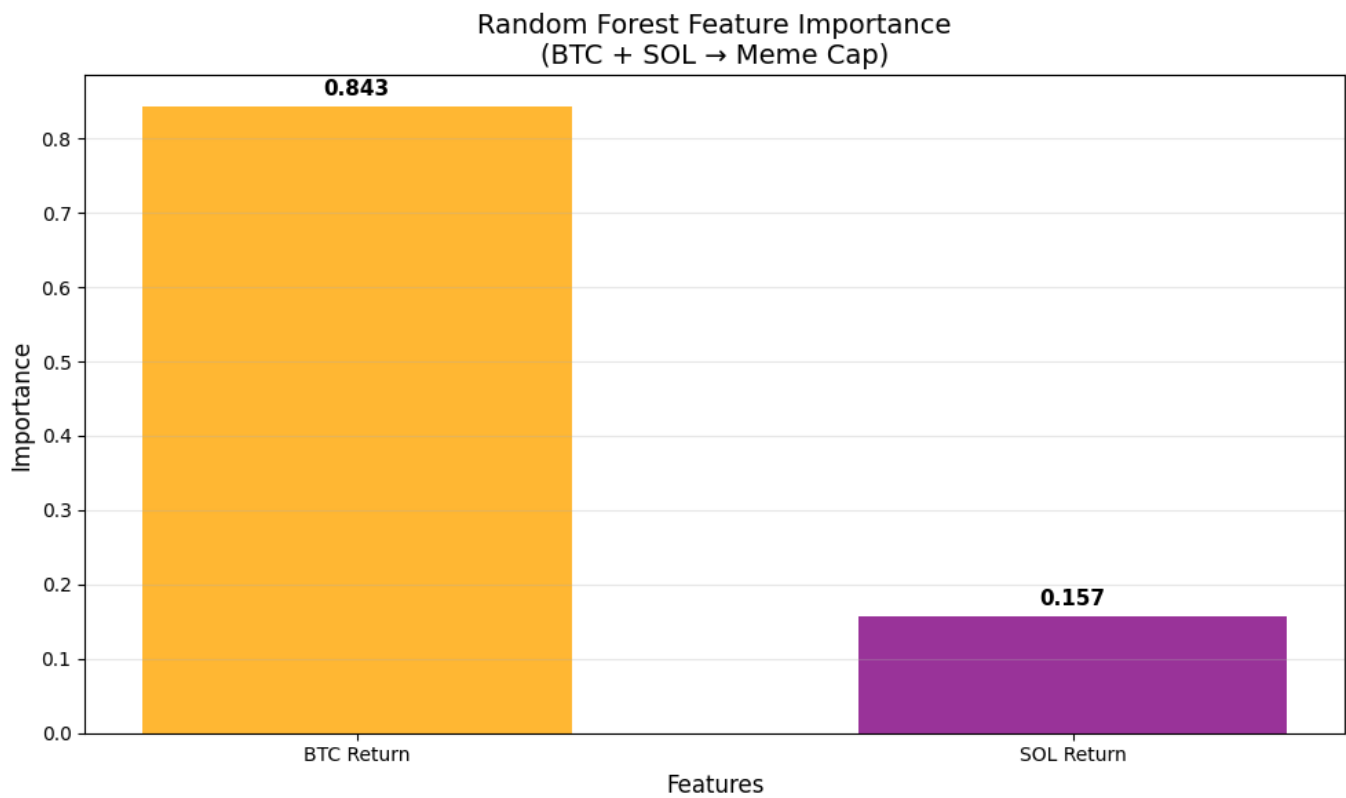


Figure 14: Random Forest feature importance

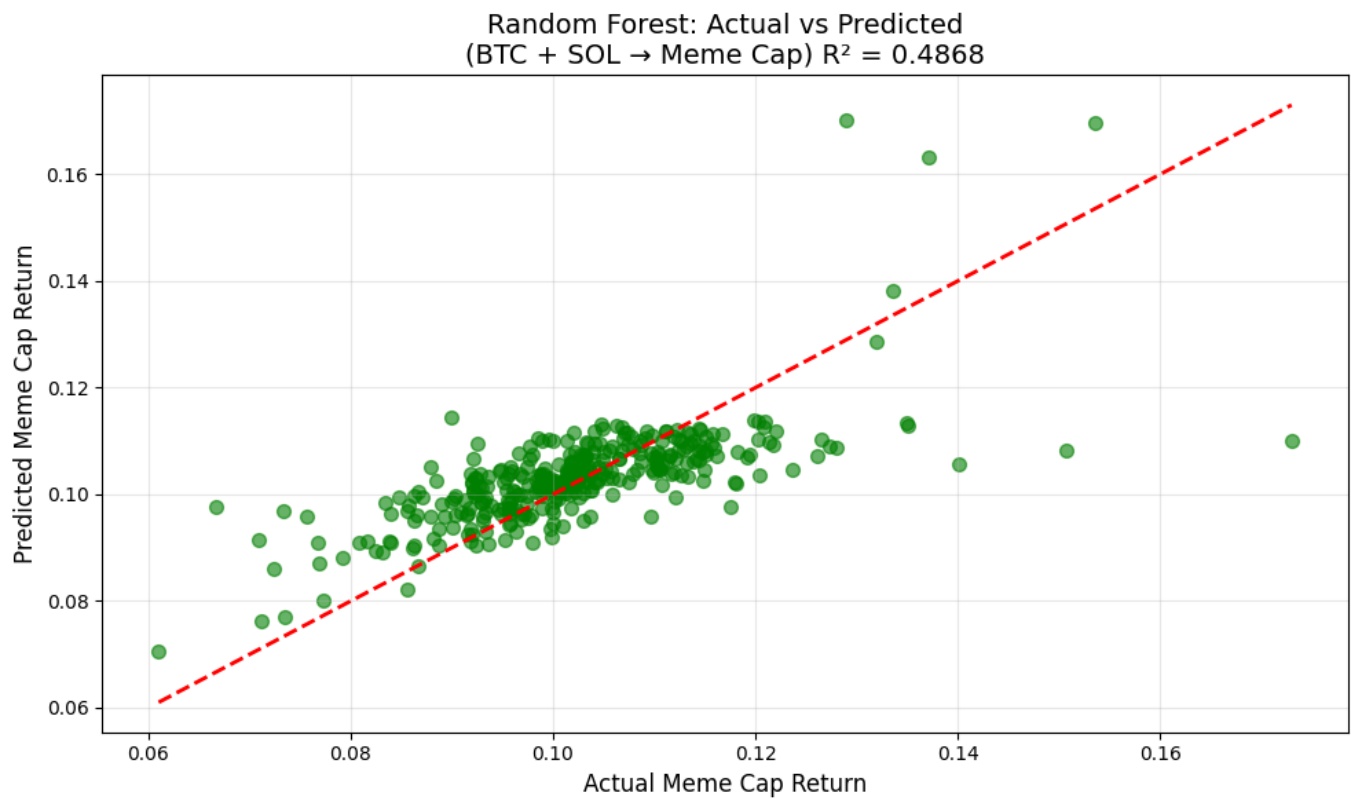


Figure 15: Random Forest results - actual vs prediction