

# ML Stock Forecasting Report

Ticker: META

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## Executive Summary

This report presents a comprehensive analysis of META stock using advanced machine learning models. The best performing model is **ML\_XGB** with a raw directional accuracy of **86.8%** (vs Buy & Hold baseline of 51.4%).

**Next Day Prediction:** HOLD/CASH (Expected Return: 6.97%)

## Model Performance Metrics

| Model                 | RMSE   | MAE    | Raw DA | Confident DA | Coverage |
|-----------------------|--------|--------|--------|--------------|----------|
| Buy & Hold (baseline) | —      | —      | 51.4%  | —            | 100.0%   |
| LINEAR                | 0.0271 | 0.0184 | 73.3%  | 73.1%        | 93.4%    |
| RF                    | 0.0149 | 0.0090 | 84.8%  | 88.6%        | 90.5%    |
| XGB                   | 0.0138 | 0.0084 | 86.8%  | 87.7%        | 93.4%    |
| GBR                   | 0.0141 | 0.0088 | 85.2%  | 88.3%        | 95.1%    |
| ELASTICNET            | 0.0178 | 0.0119 | 72.4%  | 76.6%        | 79.0%    |
| EXTRATREES            | 0.0142 | 0.0095 | 84.0%  | 86.9%        | 90.9%    |
| SGD                   | 0.0302 | 0.0172 | 75.3%  | 78.0%        | 91.8%    |

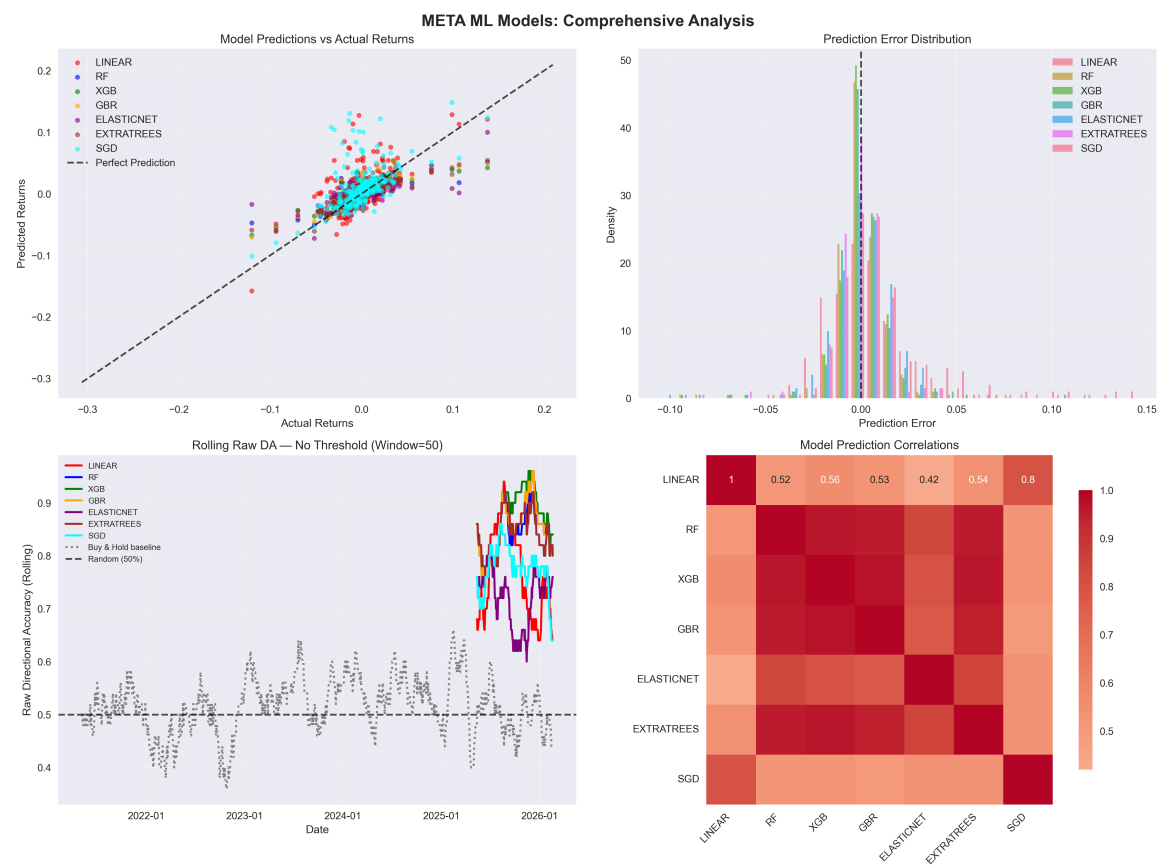
## Next Day Trading Recommendation

| Metric           | Value     |
|------------------|-----------|
| Best Model       | XGB       |
| Predicted Return | 0.07%     |
| Raw DA           | 86.8%     |
| Buy & Hold DA    | 51.4%     |
| Recommendation   | HOLD/CASH |

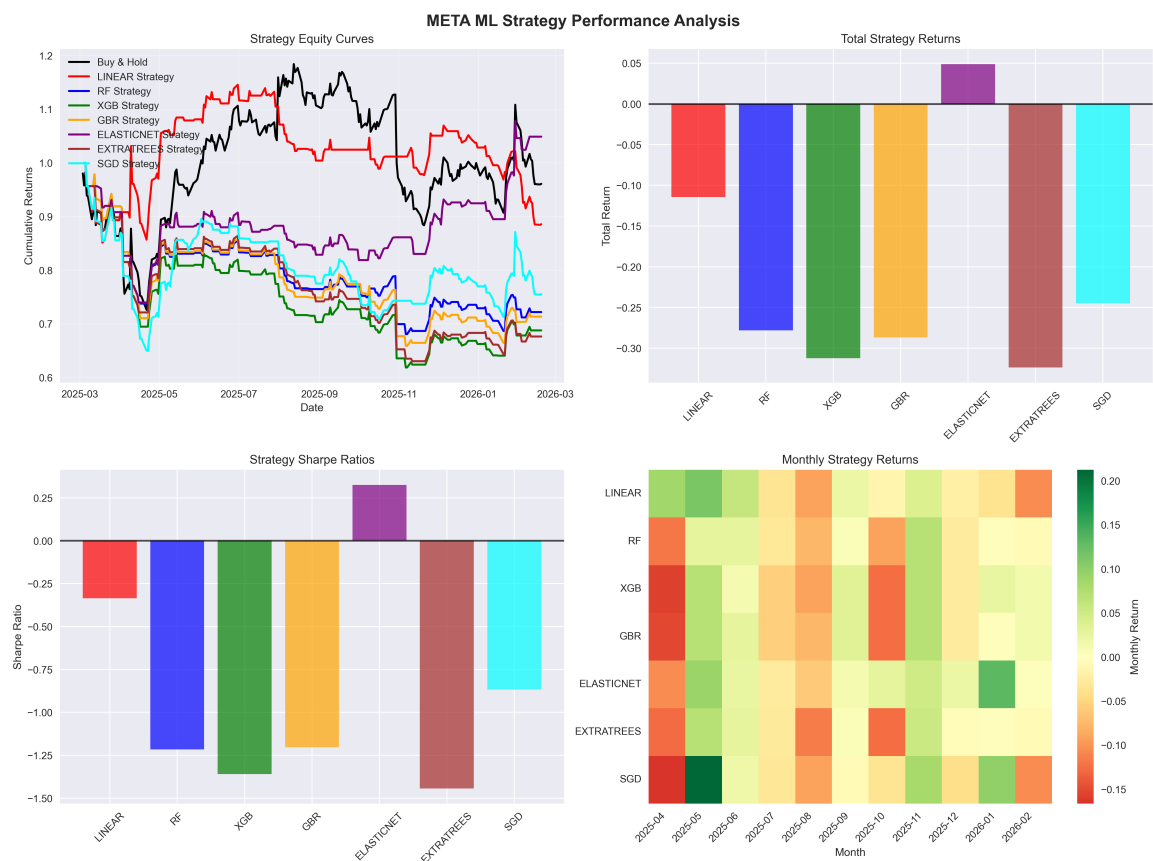


# Analysis Charts

## Model Predictions vs Actual Returns and Error Analysis



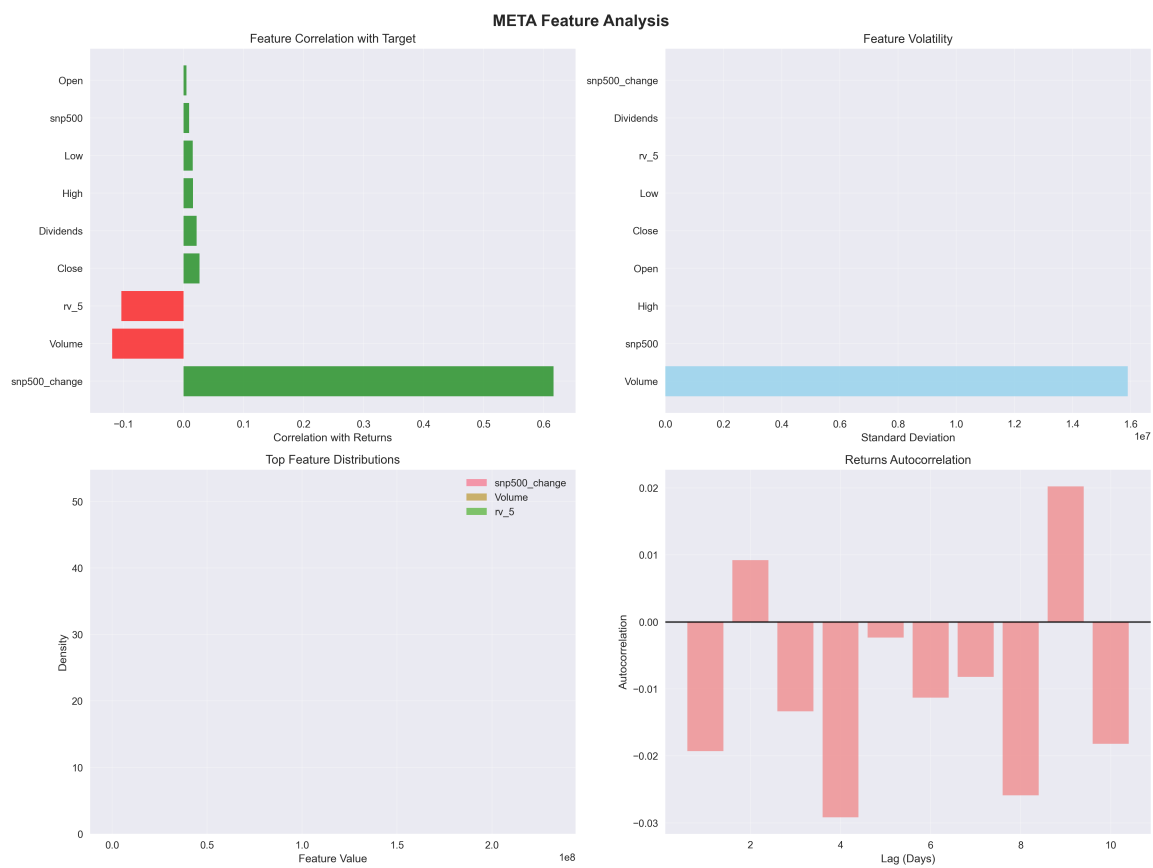
## Strategy Performance Comparison and Risk Metrics



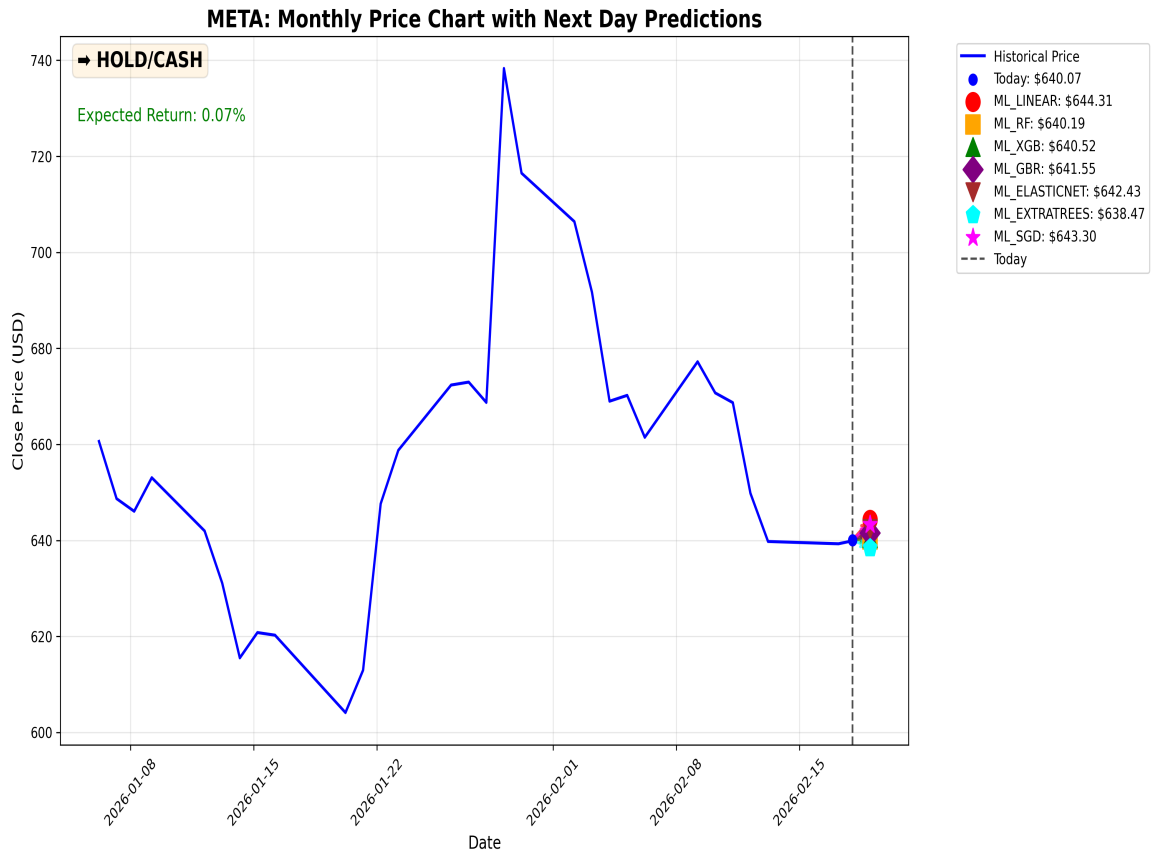
# Prediction Stability and Model Agreement Analysis



## Feature Importance and Correlation Analysis



**next\_day\_predictions**



# Conclusions & Recommendations

Based on the comprehensive ML analysis of META, the following conclusions can be drawn: 1.

**Model Performance:** The machine learning models achieve raw directional accuracies ranging from 72.4% to 86.8%, compared to the Buy & Hold baseline of 51.4%. 2. **Best Model:** ML\_XGB

provides the most reliable predictions for trading decisions. 3. **Risk Management:** The implemented threshold-based strategy (0.2% threshold) effectively reduces false signals and improves signal quality. 4. **Implementation:** Consider implementing the recommended trading

strategy with proper position sizing and risk management protocols. 5. **Monitoring:** Regular model retraining and performance monitoring is essential for maintaining predictive accuracy. **Disclaimer:**

This analysis is for informational purposes only and should not be considered as financial advice.