

Bitcoin Price Analysis and Forecasting: Key Findings

Executive Summary

The historical price movement of Bitcoin is explained in this paper, and the efficiency of ARIMA and Random Forest models is evaluated. It is found that during some periods, there was an explosive growth in the value of Bitcoin and massive volatility, with both models showing incapability in picking up the market turning points when they were so rapid and sudden, hinting at the likelihood that other economic factors could be at play, besides the historical price patterns. This report sketches the foregoing observations and statements relating to highly volatile assets.

Key Findings

Bitcoin's performance from 2013-2018 is noted for the dramatic explosion of late 2017 that resulted in an unprecedented peak of the asset, followed by a needed and significant correction throughout 2018. This price explosion was not only marked by significant exponential price increases, but also significant growth in trading activity, as reflected in the extreme rise in daily trading volume. As prices exploded, volatility also exploded, as measured by an increase in the daily high-low price range. The increase in volatility, accompanied by a substantial increase in trading volume, indicated a purely speculative market with increased market participation. Within the price series, a seasonal decomposition revealed some consistent monthly highs in the price series, but the monthly patterns were dwarfed by the extreme long-term trend and large residuals (unpredictable price changes). By uniquely characterizing those extreme price dynamics, that indicates the fundamental context for predicting Bitcoin prices is unavoidably difficult, before we even begin to talk about model performance.

Conclusion & Recommendations

The price outcomes of historical analysis of Bitcoin highlight the uncertainty and likelihood of speculation in cryptocurrency markets. Extreme price increases, almost always followed by a steep correction, indicate a market driven largely by sentiment and external catalysts instead of repeating, stable thinking. This creates an environment for price prediction that is heavily inaccurate when focused on price forecasts. Historical price and volume data are not capturing all of the possible events that may occur in the market. To increase meaningfully predictive efforts, information from alternative data sources, like social media, news stories plus sentiment, and macroeconomic signals should be considered as they provide the necessary context. These techniques should not be looked at as giving exact price predictions but use the models as tools to give directional projections, timing of volatility, and subsequent actions in a highly speculative market situation.