Original Research Article

BITCOIN POTENTIAL AFTER BREXIT REFERENDUM AND PRICE PREDICTION IN 2024

ABSTRACT

In a world of economic volatility and geopolitical tensions, the crypto market is emerging as a haven for investors seeking alternatives to traditional assets. Bitcoin also experienced an extraordinary price increase, as an alternative to stocks and gold. The purpose of this study is to determine price movements before and after the 2016 financial crisis as well as bitcoin price predictions in 2024. This study uses secondary data on Bitcoin prices from January 2011 to January 2024.The methods used are ARCH and ARIMA to determine the volatility of the bitcoin price. For predictions using the category of predictors of Bitcoin historical data at the level.In research before 2016 the condition of Bitcoin with the best model on ARIMA Model while after 2016 the condition of Bitcoin with the best model on ARCH. So that after 2016 until now there are many phenomena such as uncertain global conditions such as the China-US trade war and British Exit (Brexit), in July 2016 Bitcoin experienced a halving where the process of reducing miner rewards, Bitcoin burning officially began in 2017. Conclusion on the price of one Bitcoin coin in 2024 February to April from 43,075 to 44,066 or uptrend.

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Keywords: Bitcoin, Brexit, Volatility, Prediction

1. INTRODUCTION

Over the past 10 years, cryptocurrency investment has swept the world and has become a popular topic among investors and technocrats. The emergence of cryptocurrencies changed the traditional financial system as well as affected people's lives. Some cryptocurrencies have experienced significant increases. Many people are making their fortunes by investing in cryptocurrencies like Bitcoin (Zhao et al., 2024). Bitcoin was introduced by Satosi Nakamoto in 2008 since then many cryptocurrencies have emerged and attracted people to buy. On the coin marketcap website estimates there will be more than a thousand different types of cryptocurrencies with an accumulated market of $1.39T (Kong et al., 2024). Bitcoin price prediction poses a major challenge for cryptocurrency investors as several studies consider the features that have affected the price of Bitcoin in recent days, a new method called Learnable Window Size (LWS) to reinforce the number of days aimed at predicting the price of Bitcoin the next day (Rajabi et al., 2022). Predicting Bitcoin is a challenge for investors, traders and researchers alike (Oprea & Adela, 2024). Bitcoin is a digital version of a commodity that stores value. This is due to the limited supply and rewards of miners (Amiri et al., 2024). Macroeconomic crises are often uncertainties that are difficult to predict (Yu et al., 2024). Such is the case with the 2016 financial crisis that could give rise to unforeseen extreme circumstances and significantly change the economic landscape.Uncertain global conditions are a problem in terms of predicting Bitcoin prices as well as the trade war between China and US. The study analyzes the price of Bitcoin before and after the British Out (Brexit) referendum in 2016.

Previous research examined the impact of Brexit on London as an international financial centre through the framework of a global financial network in which Britain's decision to leave the European Union (EU), after the 2016 referendum set in motion a series of economic processes that impacted the UK, EU and other countries (Ioannou, 2024). Sentiment regarding Brexit can be identified where it can affect the stock and forex markets but the intensity of its impact on stock returns depends on the media influencing the perceptions of large and small investors (Basak et al., 2023). While on cryptocurrencies there has been no research on the impact and prediction of Bitcoin after the Brexit referendum although the value of Bitcoin is not based on the economy of any country or unlike traditional currencies and instead is based on the security algorithm, priorities, and transactions of each Bitcoin (Platanakis & Urquhart, 2020). Cryptocurrencies are quickly becoming an important aspect of global financial markets (Gajardo et al., 2018). However, given that the UK is a large country and has a great influence on global finance, it is necessary to look at conditions in another perspective from the aspect of cryptocurrency in Bitcoin. The study used Bitcoin as a sample of cryptocurrencies because Bitcoin was identified as a major market transmitter of volatility impact during less bullish periods (Parikh et al., 2023). This study uses monthly data on the average price of Bitcoin from January 2021 to January 2024 taken from investing.com website.

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2. THEORETICAL FRAMEWORK

2.1 Cryptocurrency

Cryptocurrency is a method of forming virtual coins and providing ownership and secure transactions using cryptography. Cryptocurrencies are designed to be easily verifiable but computationally difficult to reach a solution. Cryptocurrency assets, which are relatively recent developments, have significance due to their dual function: they can act as an alternative to traditional fiat currencies and as tokenized securities. These assets emerged from blockchain technology as well as being traded on centralized platforms like Coinbase (Subramanian et al., 2024)

2.2 Bitcoin

Bitcoin or BTC is a digital currency that is not issued by an institution or government. Bitcoin utilizes a peer-to-peer network as a medium of distribution using sophisticated cryptographic protocols. Electronic coin is a series of digital signatures. All Bitcoin transactions are posted in blocks to an open ledger known as the Blockchain for miners to verify using cryptographic proofs. With a peer to peer system that allows online payments to be sent directly from one individual to another without going through a financial institution and is considered an alternative currency (Platanakis & Urquhart, 2020).

Several factors contributed to the rise in BTC prices, and one of them was the resurgence of interest from institutional and retail investors in the crypto market. Traditional financial institutions, hedge funds or investment management companies, and individual investors are increasingly paying attention to Bitcoin as an asset class with significant profit potential.The growing recognition of cryptocurrencies as a legitimate investment is not only driving demand for Bitcoin but also leading to increased adoption, which in turn is underpinning the rise in Bitcoin prices.

2.3 Blockchain

Bitcoin's price surge did not occur in isolation but is part of a broader trend in the crypto market. This extraordinary growth illustrates the expanding level of adoption and integration of these digital assets into the global financial landscape. This growth is not only driven by speculative attitudes, but also by the adoption of blockchain technology.Blockchain is a database that stores a growing number of records that are governed by several entities. Blockchain (Distributed Ledger) is a system of services that can be trusted to a group of nodes where generally Blockchain acts as a trusted and controllable third party to maintain a

common state, provide a secure computing engine and mediate exchanges (Cachin & Vukolić, 2017).

3. METHODS

3.1 Data and Sources

This research uses secondary data on Bitcoin prices obtained from investing.com website. This data is processed on a monthly time series basis from January 2011 to January 2024. This is because cryptocurrencies have no vacation time in the market so that price movements are 24 hours non-stop.

3.2 Descriptive and Statistical Models

The analysis tool method used in this study looked at the condition of Bitcoin before and after the Brexit referendum to analyze price volatility using the ARCH and ARIMA models.

3.2.1 Unit Root Test

In the root unit test, it is used to determine whether a series of data is stationary or not. Time series data is said to have a stationary nature if the time shift does not affect the distribution pattern of time series data and the series is stationary, indicating that the mean, variance and autocorrelation structure remain static over a certain period of time. In conducting the stationary test, the Dickey-Fuller Augmented test is applied which includes the null hypothesis in the presence of a root unit (Kayani et al., 2023). Here is the equation to illustrate ADF testing.

$$\Delta \mathbf{y}_t = \propto_0 + \boldsymbol{\theta} \mathbf{y}_{t-1} + \sum_{i=1}^{n} \propto \Delta \mathbf{y}_t + \mathbf{e}_t \dots\dots\dots\dots\dots (\mathbf{3.1})$$

Where y refers to the time series. t indicates the timeframe and n indicates the optimal amount of Lag $\propto$ is the term constant and e is called the error term.

3.2.2 Uji EfekARCH

Comment [RV6]: Please give logic using Indonesian language.

The ARCH-LM test abbreviated as Auto-Regressive Conditional Heteroscedasticity-Lagrange Multiplier is applied in confirming the presence of Heteroscedasticity and the effect of ARCH on residues (Kayani et al., 2023). Furthermore, the mathematical equation includes the following:

$$\boldsymbol{u_t^2} = \boldsymbol{\gamma_0} + \boldsymbol{\gamma_1 u_{t-1}^2} + \boldsymbol{\gamma_2 u_{t-2}^2} + \cdots + \boldsymbol{\gamma_p u_{t-p}^2} + \boldsymbol{v_t} \dots\dots\dots\dots\dots (\mathbf{3.2})$$

Where *are* you on the remaining square that can be calculated with a basic regression model. However, developments are included in secondary regression models.

3.2.3 Uji ARIMA Model

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In the Autoregressive Integrated Moving Average (ARIMA) model which is denoted by ARIMA (p, d, q). The three parameters p, d, and q correspond to the Autoregressive sequence, the integration order, and the moving average sequence respectively (Mati et al., 2023).

$$\boldsymbol{\Psi p_t^0} = \boldsymbol{\alpha_0} + \boldsymbol{\Gamma \varepsilon_t} \dots\dots\dots\dots\dots (\mathbf{3.3})$$

The p value is assumed to be stationary in Bitcoin, e is an error in research, Γ is a moving average.

4. RESULTS AND DISCUSSION

4.1 Analysis of Bitcoin Before Brexit Refrendum

Comment [RV8]: Referendum

In research before the Brexit Refrendum, an analysis of Bitcoin prices was carried out from 2011 to 2016. The following is the condition of Bitcoin price movement based on the Scatter Plot in figure 1.

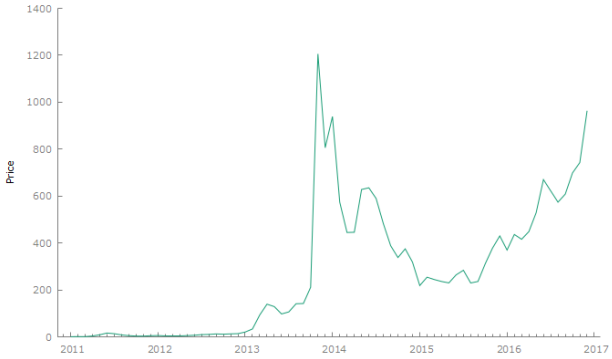

Figure 1. Bitcoin Price Scatter Plot 2011-2016

In figure 1. Shows the price of Bitcoin at the beginning of 2011 to 2013 experienced a stagnant movement and then in 2013 to late 2016 began to experience volatility movements. Therefore, it is necessary to do a unit root test in knowing that the price of Bitcoin has stationary at Level, First Different, or Second Different. The following are the results of the unit root test described in table 1.

Table 1. Bitcoin Price Root Test Unit Results 2011-2016

Level	First Different
P-Value: 0.445	P-Value: 0.0001

Source: Data Processed by Researchers, 2024.

At the level of the root test unit result level, the P-Value value is still greater than 5%, therefore it is continued on the root test unit again at First Different which obtained a P-Value of less than 5%, which means stationary results at First Different so there is no need to continue at Second Different.

Then the chorelogram test shows ACF and PACF values at Lag 1. The value of d is at the stationary value of First Different according to the results of the root unit of table 1, then Lag is 1. The ACF and PACF values can be seen in figure 2 below.

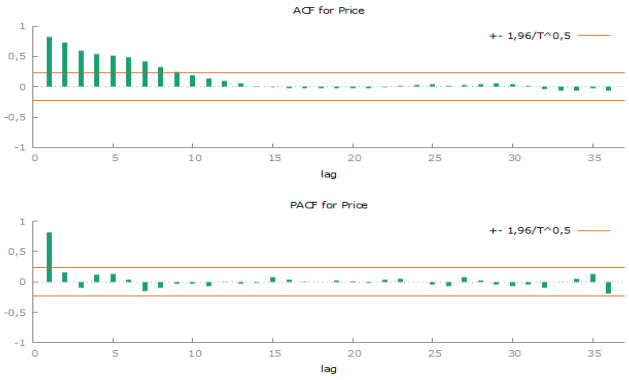

Figure 2. Bitcoin Price Correlogram Test 2011-2016

Furthermore, the ARCH Test is carried out in finding out the best model. In the results of this study, the P-Value value on the ARCH Test was 0.174126 so that it can be interpreted as P-Value >5%, then the data is continued by the ARIMA Test. In the ARIMA Test results, the following results are obtained in table 2.

Table 2. ARIMA Bitcoin Price Test Results 2011-2016

TYPE	R2	AIC
ARIMA (1,1,1)	0,061244	905,4736
ARIMA (0,1,1)	0,004899	907,0529
ARIMA (0,1,0)	0,054650	963,3357
ARIMA (1,1,0)	0,000058	927,5726

Source: Data Processed by Researchers, 2024.

Based on the table above, it can be explained that the AIC value that has the smallest value is the best model. So that ARIMA (1,1,1) with an AIC value of 905,4736 is the best model. This is of course done ARCH Test again for the best model ARIMA (1,1,1) to find out if there is heteroscedasticity in the model. The results of the ARCH Test obtained a P-Value of 0.999972 which means that the model does not have heteroscedasticity. However, if the P-Value value is <0.05, it is necessary to do further tests with the GARCH Test. So that the results of the Bitcoin price volatility test before the Brexit referendum from 2011 to 2016 obtained the best model results on ARIMA (1,1,1).

Comment [RV9]: R-squared. Are the R-value in comma, I thinlk it is decimal.

4.2 Analysis of Bitcoin After Brexit Referendum

In research after the Brexit Refrendum, an analysis of Bitcoin prices was carried out from 2017 to 2024. Here are the conditions of Bitcoin price movements based on the Scatter Plot in figure 3.

Comment [RV10]: Referendum

Figure 3. Bitcoin Price Scatter Plot 2017-2024

In figure 3. Shows the price of Bitcoin at the beginning of 2017 to 2024 in January experiencing price movements up and down or there is volatility. Therefore, it is necessary to do a unit root test in knowing that the price of Bitcoin has stationary at Level, First Different, or Second Different. The following are the results of the unit root test described in table 3.

Table 3. Bitcoin Price Root Test Unit Results 2017-2024

Level	First Different
P-Value: 0.6275	P-Value: 5,652e-08

Source: Data Processed by Researchers, 2024.

At the level of the root test unit result level, the P-Value value is still greater than 5%, therefore it is continued on the root test unit again at First Different which obtained a P-Value of less than 5%, which means stationary results at First Different so there is no need to continue at Second Different.

Then the correlogram test shows ACF and PACF values at Lag 1. The value of d is at the stationary value of First Different according to the results of the root unit of table 1, then Lag is 1. The ACF and PACF values can be seen in figure 4 below.

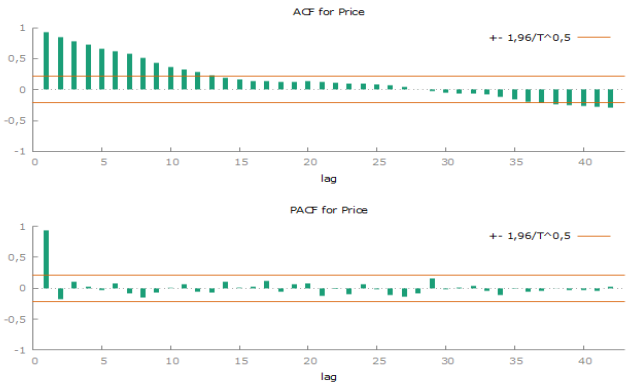

Figure 4. Bitcoin Price Correlogram Test 2017-2024

Furthermore, the ARCH Test is carried out in finding out the best model. In the results of this study, the P-Value value on the ARCH Test was 0.0115998 so that it can be interpreted as P-Value <5%, so the best model on the ARCH Effect which does not need to be continued ARIMA test. So that the results of the Bitcoin price volatility test after the Brexit referendum from 2017 to 2024 obtained the best model results on the ARCH Effect. This proves that from the beginning of 2017 the price of Bitcoin has experienced volatility because Bitcoin gets sentiments such as burning, halving, and uncertain global conditions.

4.3 Bitcoin Price Prediction Analysis in 2024

In the forecasting results calculated based on the monthly average from January 2017 to January 2024, which then carried out Bitcoin price predictions until April 2024, the following results were obtained:

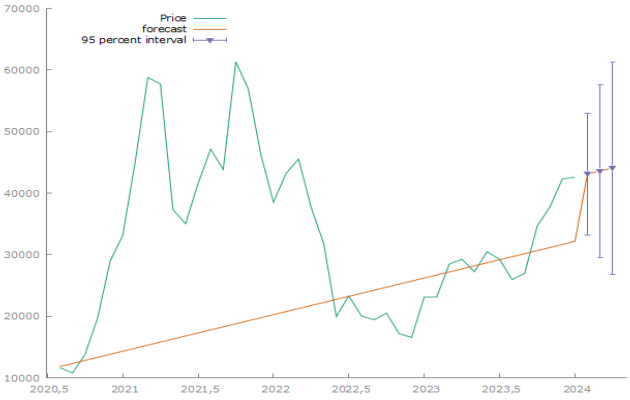

Figure 5. Bitcoin Price Prediction for February 2024 – April 2024

The value of the Bitcoin price after being predicted to experience an uptrend condition with a range of $43,075 in February 2024 to $44,066 in April 2024.

5. CONCLUSION

~~In this research related to "Bitcoin Potential After Brexit Referendum and Price Prediction in 2024" can be concluded as follows:~~

1. The Condition of Bitcoin Before 2016

In the analysis of Bitcoin price volatility from January 2016 to December 2016 has the best model selected on ARIMA (1,1,1) with a P-Value value of 0.999972 in the last test with the second ARCH Test (using the Best ARIMA model) to find out that the model does not have hetroscedasticity because of the P-Value value of >5%. Since the P-Value value is >5%, there is no need to do a GARCH test. The ARIMA model (1,1,1) is the best model where the R-Squared value is 0.061244 and the Akaike Criterion is 905.4736.

2. The Condition of Bitcoin After 2016

In the analysis of Bitcoin price volatility from January 2017 to January 2024 has the best model selected in the ARCH Effect where the P-Value value is 0.0115 in the last test with the ARCH Test to find out that the model does not have hetroscedasticity because the P-Value value is <5%.

3. Bitcoin Forecasting February to April 2023

In the forecasting results, the price of Bitcoin tends to experience an uptrend from the price of one Bitcoin coin of $43,075 in February to $44,066 in April 2024. This Bitcoin price is showing in a bullish phase.

Although in this study the price of Bitcoin experienced an uptrend movement, it is necessary to know factors such as price volatility, market conditions and changes in regulations that can affect the price of Bitcoin. Therefore, investors need to pay attention to market developments and conduct careful analysis before making decisions in investing considering that Bitcoin price movements can change quickly considering the cryptocurrency market moves 24 hours non-stop, so it is very sensitive to sentiment.

Comment [RV11]: Rewrtie the conclusion. It is seen as a repetation of the findings of the data analysis. Better comprise the discussion with conclusion.

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