Cryptocurrency Risk Determinant Impact During Covid-19 Pandemic Moment: Emperical Case From Indonesia

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Abstract. Bitcoin is virtual money or electronic money that does not have a fixed or physical form that can be seen in the real world but is available and used in cyberspace. Bitcoin is one type of cryptocurrency spread in the world. In the current era of the covid-19 pandemic, the use of cryptocurrencies is increasingly in demand, including bitcoin. In this study, the independent variables consisting of Cost Per Transaction, Total Circulating Bitcoin, Total Hast Rate, Transaction Rate Per Secondbitcoin price as dependent variable. The data taken to answer this phenomenon are:secondary data sourced from https://m.id.investing.com/. Researchers used multiple linear regression method with E-views as a calculation tool to get good results. The number of bitcoins, transaction fees, mining difficulties and bitcoin legalization can affect bitcoin price fluctuations. The results obtained from this study are Variable Cost Per Transaction and the total hash rate has a negative and significant effect, while Total Circulating Bitcoin and the transaction rate per second has a positive and significant effect on bitcoin price fluctuations.

Keywords: Cryptocurrency; Bitcoin; Pandemic Covid-19.

1 Introduction

Cryptocurrency has now become a means of payment at this time. Cryptocurrencies are also currently developing into several types including etherium, ripple, bitcoin cash, and Litecoin (Ausop & Aulia, 2018). During the COVID-19 pandemic, investments such as gold and bitcoin are in great demand. Even though the volume is bigger in gold than bitcoin. Through the Morlet Wavelet approach, it was found that in the long term the return on gold was higher than bitcoin which was more profitable in the short term(Shehzad et al., 2021). This is one of the reasons why the price of bitcoin fluctuates today.

Since appearing and known by the public, the price of Bitcoin can fluctuate to more than $100 and it is difficult to guess what the price should be because it is always changing. People today are looking for Bitcoin because it is considered easy and profitable for many parties. Unfortunately, some countries around the world have started to ban their people from using Bitcoin. This is because there is no single authorization agency that handles and oversees Bitcoin

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payment transactions. In addition, the unique thing is that Bitcoin transactions can create and change all forms of personal data, such as name, address, name of the sender and name of the recipient of the transaction, into a code that will be generated for payment transactions, making transactions difficult to uncover in the event of fraud and fraud. As a result,(Lancelot & Tatars, 2013).

Information about the price structure of bitcoin cannot be explained by the standards of existing and emerging economic theories today. There are several things that make this Bitcoin transaction affect the reduced interest in making other transactions including the total number and transaction of Bitcoin payments circulating in the bitcoin transaction market in several countries. Next is the number of activities to make a lot of transactions every day(Kristoufek, 2014). The number of transaction activities in question are transaction activities that are closely related to bitcoin funds (blockchain). This transaction includes many Bitcoin buying and selling transactions that are carried out several times to generate profits(Guttmann, 2014).

(Poyser, 2017)shows the determinants of crypto prices grouped into internal and external factors. According to Poyser, the internal factors that can affect the price of crypto are those included in supply and demand such as: Transaction fees, Rewards from the system, Mining difficulty, Coin movement and Forks (changing rules). Meanwhile, the external factors are attractiveness (popularity), market trends, speculation, stock market, gold prices, interest rates, legalization, and restrictions/rules. The first factor that causes the bitcoin price to fluctuate is the market price. The bitcoin market price is always fluctuating and unpredictable even though using data or history of bitcoin price fluctuations in the market in the past, especially in short-term investments(Othman et al., 2019).

Then the second factor is Bitcoin Hashrate. The difficulty in mining bitcoin makes the availability of bitcoins limited. This makes the price very volatile. By using the Wavelet method, it is found variations in the magnitude of bitcoin movements in the long term and short term so that the price of bitcoin fluctuates(Rehman & Kang, 2021). The difficulty in mining bitcoin is also what makes some "miners" penetrate the blockchain and control the price of bitcoin itself so that bitcoin price instability occurs in the market.(Kroll et al., 2013).

The third factor is the legalization of bitcoin. The legality of bitcoin itself is still being questioned, especially in several countries, especially in Indonesia. Although many companies have used bitcoin as a payment medium, there are no regulations or laws in Indonesia that state the legality of bitcoin itself. The electronic money payment system in Indonesia is regulated by Article 5 paragraph (3) of the ITE Law. In addition, Article 2 of Law Number 7 of 2011 concerning Currency states that the legal money that becomes legal tender in the Unitary State of the Republic of Indonesia is the rupiah.(Honggowongso, 2021).

The fourth factor is the level of transactions. As for the findings of research that has been done to see the level of bitcoin transactions on price fluctuations, the results have a positive effect(Widyawati, 2015). And the fifth factor is bitcoin transaction fees. Bitcoin transaction fees are very large, causing the price of bitcoin to soar very high. It was recorded that in 2018 the cost per bitcoin transaction reached 243 thousand rupiah(Nurjannah I Gede, 2019). Refer to the site (bitcoin.co.id, 2021), the current bitcoin price is IDR 676,084,000. This shows that the amount of bitcoin transaction fees (BTC) is very influential on the ups and downs (fluctuations) of bitcoin prices.

2 Text formatting

2.1 Market Price

This study uses secondary data with the type of time series data during the period December 2019 to July 2021 (data attached). The data used in this study were taken from: https://m.id.investing.com/ danwww.blockchain.info. If you pay attention to the time series data graph, the movement was very smooth before the pandemic occurred in early 2020. After the pandemic from 2020 to July 2021, bitcoin price movement data tended to be more volatile considering the increasing number of bitcoin transactions during the pandemic.

2.2 Cost Per Transaction

This study uses secondary data with the type of time series data during the period December 2019 to July 2021 (data attached). The data used in this study were taken from: https://m.id.investing.com/ danwww.blockchain.info. If you pay attention to the time series data graph, the movement was very smooth before the pandemic occurred in early 2020. After the pandemic from 2020 to July 2021, the data on the movement of bitcoin transaction fees tends to be more volatile considering the increasing number of bitcoin transactions during the pandemic.

2.3 Total Circulating Bitcoin

This study uses secondary data with the type of time series data (time series) during the period December 2019 to July 2021 (data attached). The data used in this study were taken from: https://m.id.investing.com/ danwww.blockchain.info. If you pay attention to the time series data graph, the movement was very smooth before the pandemic occurred in early 2020. After the pandemic from 2020 to July 2021, the data for the movement of bitcoin turnover increased significantly considering the increasing demand for bitcoin during the pandemic.

2.4 Total Computing (Total Hast Rate)

This study uses secondary data with the type of time series data during the period December 2019 to July 2021 (data attached). The data used in this study were taken from: https://m.id.investing.com/ danwww.blockchain.info. If you look at the time series data graph, the movement tends to be volatile before the pandemic occurred in early 2020. After the pandemic from 2020 to July 2021, the computational data (total hast rate) was smoother because the pandemic with all the resulting economic consequences made bitcoin mining activities stop. From the descriptive statistical table of the research variables above, it can be seen in the variable Y that the lowest Total Computing Rate (Total Hast Rate) is USD 105663297.2/day and the highest is USD 9.98045E+15 /day, with an average of USD 9.94144E+14 /day during the Covid-19 pandemic.

2.5 Transaction Speed (Transaction Rate Per Second)

This study uses secondary data with the type of time series data during the period December 2019 to July 2021 (data attached). The data used in this study were taken from: https://m.id.investing.com/ danwww.blockchain.info. If you pay attention to the time series data graph, the movement tends to be volatile both before the pandemic occurred in early 2020 and also after the pandemic from 2020 to July 2021 this is due to the increasing number of transactions during the covid 19 pandemic.

3 Equations, Formulas and Code

This study describes the variables that affect bitcoin price fluctuations during the covid 19 pandemic. In this study, the dependent variable is the bitcoin price, while the independent variable in this study is the number of bitcoins, the number of transactions , transaction fees, mining difficulties and legalization. This study uses secondary data with the time series method in the period January 2020 to February 2021 (weekly). Secondary data in this study were taken through sources such as through websites: https://m.id.investing.com/ and www.blockchain.info. The total effect of bitcoin, the number of transactions, the cost per transaction, the difficulty of mining, the legalization of the bitcoin price in the January 2020-2021 period can briefly be explained with the following function.

PBTC = f(JBTC, BBTC, TBTC, KBTC, LBTC)

Furthermore, the above equation is converted into an equation model using the multiple linear regression method, namely:

PBTC = ao + a1 JBTC + a2 BBTC + a3 TBTC + a4 KBTC + e1 where:
PBTC = Bitcoin price (USD)
JBTC = Number of bitcoins (coins)
BBTC = Bitcoin transaction fee (USD)
TBTC = Bitcoin transactions (times)
KBTC = Difficulty mining bitcoin (H/s)

In order for the calculation to be accurate and to reduce the error rate, a statistical data processing program is used, namely the Eviews 4.1 program with a significance degree of 95 percent or an error rate of 0.05.

Test of Goodness Of Fit

The Test of Goodness Of Fit is carried out based on the results of data processing t test (partial test), F test (over all test) and the calculation of the coefficient value of the determinant (R2). The t-test aims to see how big the level of significance of the influence of each independent variable on the dependent variable. For this significance test, the calculated t-value is compared with the t-table value at a certain level of confidence and degrees of freedom. The formula for calculating the t-test, namely:

t = (β – 0) / Sβ
where: t = t-test value
 = true exogenous variable coefficient value
0 = coefficient value of exogenous variable with hypothesis = 0
Sβ = standard error of estimation

If the value of t-count t-table indicates that Ho is rejected, otherwise if the value of t-count≤ t-table indicates Ho is accepted. For the value of the F test, it is useful to simultaneously test whether the independent variable as a whole has an effect on the dependent variable.

H0 : total bitcoins, number of transactions, transaction fees, mining difficulties, simultaneous legalization have no effect on bitcoin prices.

Ha : total bitcoin, number of transactions, transaction fees, mining difficulties, legalization simultaneously have a significant effect on bitcoin price variables.

Coefficient of Determination (R2)

The determination of the coefficient of determination (R2) is carried out to measure how close the relationship between the models is from the equation. The coefficient of determination

(R2) which shows how much the spread of variance is able to explain how much the influence of the independent variable (independent variable) can explain the dependent variable (the dependent variable) or can explain the ability of the independent variable (the independent variable) to accurately explain the dependent variable (the dependent variable).).

Classical Assumption Deviation Test

In addition to the statistical tests that have been carried out, when determining the analysis of the regression equation model, several obstacles are often faced, so that the classical assumption test appears, where this test explains whether or not there is a relationship between independent variables and dependent variables that meet the assumptions of normality, multicollinearity and autocorrelation. This research is related to research whose data uses data attributes that use a time series dimension so that the classical assumption test is carried out using the multicollinearity test, and the autocorrelation test.

The normality test is used to explain whether the mean value of , which is equal to zero, is not related to each other and the variance is constant. With the estimates made, it will be able to meet the desired characteristics by the party making this estimate (the estimator), such as inappropriate habits and minimum variances, so that it can be known whether or not the value of is normal by using the Jarque-Bera test (JB Test).). The normality test can be used to estimate residuals and perform probabilities on X2, namely by estimating the calculated JB value and comparing X2 calculated with X2 table. So that some decision-making criteria can be obtained as follows:

H0 : describes normally distributed data

Ha : explains the data is not normally distributed

The occurrence of autocorrelation can be detected through the chi-square probability, namely:

If the probability value of chi square $> \alpha = 0.05,$ means Ho will be accepted

If the probability value of chi square $\alpha = 0.05,$ means Ho will not be accepted (rejected)

If the probability value of chi-square (X2)0.05, then Ho will be accepted or there is no autocorrelation between independent variables. On the other hand, if the probability value of chi-square (X2) 0.05, then Ho will not be accepted or there will be autocorrelation between independent variables.

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