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Article

Horizon of Cryptocurrency Before Vs During COVID-19

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Abstract: Cryptocurrencies are now the most popular investment instruments among millenials. Crypto offers great returns in a short period of time. Prior to COVID-19, Crypto experienced significant price fluctuations accompanied by an increase in the number of high transaction volumes. This situation was disrupted by the presence of the COVID-19 which made the world economy devastated, marked by the decline of stock prices in the world, especially in Indonesia. A paired test was conducted in this study to compare the state of Crypto before and during COVID-19 with the variables of Risk, Transaction Volume, Return, and Sharpe Performance. The results showed that there was a significant difference in the variables of Transaction Volume and Return. However, there was no significant difference in the Risk and Sharpe performance before and during COVID-19. This study shows that despite the COVID-19 pandemic, the enthusiasm of investors who transact crypto assets is not affected and they still get returns in accordance with the investments made. The high risk will be followed by a high standard deviation, so that the Sharpe Performance is small. Cryptocurrencies still have many gaps to research, such as regulation, so that many countries have not legalized Crypto transactions. If there is no regulation for Crypto, it is certain that an increase in cybercrime harms crypto investors and threatens global financial stability. Nevertheles, with or without COVID-19, investment transactions gain and lose based on confidence in the limited market. Therefore, the success of confidence fluctuations in crypto encourages the emergence of alternative coins created by investors to conduct an Initial Coin Offering (ICO).

Keywords: COVID-19, Cryptocurrency Return, Risk, Transaction Volume

1. Introduction

Technological growth in the last 10 years has moved very rapidly, marked by the emergence of thousands of types of cryptocurrencies in the virtual world market. Cryptocurrency is a medium of exchange or digital money that is intended as a digital payment instrument. Thousands of Cryptos are also traded in the market. Based on the price movement, the Crypto movement is classified as high volatility. The high volatility price movement indicates that Crypto assets experience significant price changes within a certain time, so the risk that will be obtained by investors will be high. Crypto investment is an attraction for millennials, because Crypto has high price fluctuations so that from there you can get high profits in a short time. The condition of high price fluctuations is not always bad, but good literacy is needed for investors to recognize the characteristics of these Crypto investments.

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Bitcoin is a pioneer of digital exchange for financial transactions, which is expected to re-place the current currency, and has a reliable system that cannot be duplicated. The nature of Bitcoin is similar with crypto, namely digital money that has a centralized market and there are no regulations governing transactions. Digital financial transactions are widely criticized by researchers who argue that cryptocurrencies are currently used by traders as speculative investments because prices are very volatile (Grinberg, 2012). Yermack (2015) and Brière et al (2015) state that crypto prices are highly volatile. This makes crypto assets were classified as speculative assets and has a high risk and will affect the behavior of crypto users and traders.

Regulatory uncertainty in regulating crypto raises doubts for some countries to legalize the process of buying and selling or transacting crypto (Bouri et al, 2017; Aalborg et al, 2018; Demir et al, 2018; Wang et al, 2019; Wu et al, 2018). Every investment asset certainly has a fundamental value on which the asset is based, but not so in crypto. Crypto assets do not have clear fundamentals so that crypto prices have high volatility, so in the future it will create a big bubble of crypto prices. According to Phillips et al (2015), Corbet et al (2018), and Bouri et al. (2018), the bubble occurs due to a large and positive event that makes the bitcoin market more excited and makes the bitcoin price rise significantly.

Various methods have been used by researchers to track crypto speculation such as those conducted by Cheah and Fry (2015) and Fry and Cheah (2016). Enoxen et al (2020) has detected the occurrence of cryptocurrency bubbles in the period 2017 and 2018 on Bitcoin (BTC), Ethereum (ETH), Ripple (XRP), Litecoin (LTC), Monero (XMR), Dash coin (DASH), Nem coin (XEM) , Dogecoin (DOGE), this is in line with the research of Bouri et al (2018) which concludes that the price of bitcoin in 2017 to 2018 reached its highest point, this price is read from the high transaction volume and volatility variables. Enoxen et al (2020) added that the occurrence of bubbles was also seen in Google Trends, with a positive relationship between bubbles and transaction volume.

Xiao et al (2021) explained that during COVID-19, Bitcoin experienced a significant increase in price. However, the cryptocurrency strategy is very different from the strategy for foreign exchange markets, portfolio diversification, and macroeconomic policy. Crypto development is at its best when the Covid 19 outbreak hits the world. This condition made stock investment decrease significantly, especially in Indonesia. Many stocks in Indonesia Stock Exchange experienced significant price declines, so the government temporarily suspended the stock trading process for a few days in March 2020. Thus, this study aims to test whether there are differences in Crypto trading before and during COVID-19 based on several variables proposed in the study. The variables tested in this study are risk, transaction volume, return, and Sharpe. The risk variable is measured by Value at Risk (VaR). Meanwhile, the Sharpe variable is used to measure Crypto's performance.

There are many choices in financial investment instruments, including investing in stocks, bonds, mutual funds, to derivatives, including options and futures. In addition, there were also rapid technological advances with the discovery of blockchains so that the blockchain network produced new financial instruments, namely cryptocurrencies (Ayedh et al, 2020). The cryptocurrency market within the last 10 years has been growing very rapidly (Xi et al, 2020). In 2017 the price of Bitcoin has gone up by 1,300% (Lammer et al, 2020). The significant growth of Bitcoin is characterized by a high rate of return so that many individual investors invest in this asset, and cryptocurrency assets are classified as assets that have extreme volatility (Ji et al, 2019).

Most researchers do not agree with crypto as a digital currency value, and some believe that crypto has value as an investment (Ciaian et al, 2016). Over time, many researchers began to conduct research on how crypto performs as an investment instrument (Bianchi and Babiak, 2020). In addition, Crypto is useful as an option in portfolio diversification (Bouri et al, 2017, Dyhrberg, 2016). Krische (2019) and Munnukka et al

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(2017) stated that financial literacy and investing experience in risky assets are very important for making individual investment decisions.

Cryptocurrency investment has the same characteristics as stocks, bonds, and commodities that can be invested (Baur et al, 2018). Cryptocurrency price movements fluctuate significantly when compared to other assets (Li et al, 2020). The statement of Li et al, (2020) is also supported by Ante et al. (2020) by showing that Cryptocurrency volatility is very volatile and carries a high risk. As crypto boomed after the emergence of bitcoin in early 2009, there are now thousands of cryptos with different features in the market, making it very difficult for investors to judge which ones are performing well and are worth investing in (Ong et al, 2015). Cryptocurrencies are currently reaching their highest point of popularity, but there are also many questions about the fundamental foundations of these cryptocurrencies so that this makes these assets potentially facing increased risk (Yilmaz and Hazar, 2018). Investors who understand risk will include cryptocurrencies in their portfolios. The strategy of including crypto into the portfolio is one of the efforts to increase income for the return portfolio. Investor enthusiasm in investing in cryptocurrency must be based on important factors in cryptocurrency (Dyhrberg, 2016).

The experience of investing in highly risky assets will have a significant ameliorating effect on subjective financial knowledge and cryptocurrency investment (Zhao et al, 2021). Zhao et al (2021) also added that Cryptocurrency is a high-risk investment. Regarding risk, it is necessary to know that risk is closely related to risk tolerance. If an investor calls the asset risky, then there is a negative direct effect relationship between the investment, thus the investor will have a lower level of readiness to invest in Cryptocurrencies. Investors who invest in this cryptocurrency are investors who are very risk tolerant, so individual investors are willing to take big risks in crypto investments (Li and Qian, 2018). In relation to risk, these emerging Crypto assets need to be regulated. Unfortunately, there are not many rules that regulate the process of running Crypto transactions (Lammer et al, 2020).

2. Methodology

This study compares a number of variables consisting of Risk calculated by Value at Risk (VaR), daily Crypto transaction volume, Crypto daily return, and daily Sharpe Ratio performance. Paired t-tests were carried out on the Top 9 Crypto on the market. Top 9 Crypto is the 9th largest market capitalization in the crypto market. Different tests were carried out by comparing 4 variables before COVID-19 and during COVID-19. This test is carried out to find out whether the COVID-19 outbreak will make Crypto investments go down, up, or not have an impact on these investments. The reason to conduct this research was because the world stock investment, especially in Indonesia, experienced a significant decline, this happened because the majority of investors panicked due to the new situation in the world.

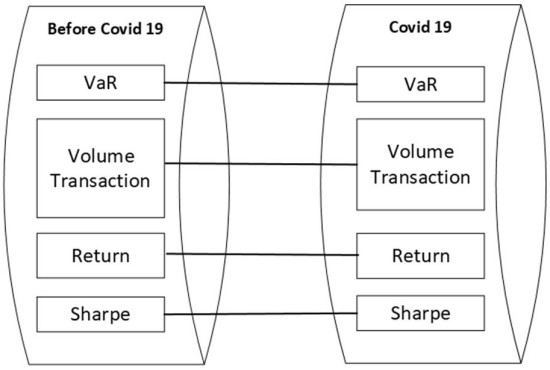

Figure 1. Research Framework

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As a result, investors immediately divert their investment funds to investment instruments that are safer and have relatively less risk. Therefore, this study will test whether there is a difference between before COVID-19 and during COVID-19 in phenomenal crypto investments. Each variable used in this study has its own advantages. First, the individual risk in each crypto is calculated using Value at Risk (VaR). VaR can measure fluctuations in crypto price movements that occur at a certain time. The higher the Crypto VaR value is a sign that there is an up or down price movement that occurs, then from there arises a risk that is difficult to predict its movement. The high price movement for irrational investors creates attractiveness despite the risk of loss.

Second, the Transaction Volume variable is the amount of buying or selling crypto at a certain time. The bigger the transaction at a certain time, the greater the enthusiasm of crypto investors to make transactions. Transactions with large amounts will make crypto prices go up and down because of the supply and demand process that is carried out at a certain time.

Third, return is the difference in price when buying and selling at a certain time. Positive return is the expectation of every investor who invests in a period. Crypto investment is a new investment and belongs to high-risk investments, so that the returns obtained will be even higher.

Fourth, Sharpe Ratio performance is a calculation to measure the level of performance of the investments made. The higher the Sharpe Ratio of an investment, the more successful investors are in managing their investment funds to generate profits. The four variables that have been described are useful for measuring investment conditions. This research focuses on Crypto investment before and during COVID-19. To overcome the problems that have been mentioned, this study proposes several hypotheses.

Hypothesis 1 There is a significant difference in VaR of Crypto before COVID-19 and during COVID-19, it can be symbolized as follows:

$$\boldsymbol{H_0 = X_1 = X_2}$$
$$\boldsymbol{H_1 = X_1 \neq X_2}$$

Hypothesis 2 There is a significant difference in Crypto Transaction Volume before COVID-19 and during COVID-19, it can be symbolized as follows:

$$\boldsymbol{H_0 = X_1 = X_2}$$
$$\boldsymbol{H_1 = X_1 \neq X_2}$$

Hypothesis 3 There is a significant difference in Crypto Returns before COVID-19 and during COVID-19, it can be symbolized as follows:

$$\boldsymbol{H_0 = X_1 = X_2}$$
$$\boldsymbol{H_1 = X_1 \neq X_2}$$

Hypothesis 4 There is a significant difference in Sharpe Ratio of Crypto before COVID-19 and during COVID-19, it can be symbolized as follows:

$$\boldsymbol{H_0 = X_1 = X_2}$$
$$\boldsymbol{H_1 = X_1 \neq X_2}$$

In this study, the calculations will be carried out through the following formulas:

Stock Return, $\boldsymbol{Ri = \frac{p_t - p_0}{p_0}}$ ..... (1)

Beta, $\beta_i = \frac{\sigma_{i,m}}{\sigma_m^2}$ ..... (2)

Alpha, $\alpha_i = E(R_i) - \beta_i . E(R_m)$ ..... (3)

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Value at Risk Individual, $\boldsymbol{\sigma^2} = \sum_{i=1}^{n} \frac{(R_{it} - E(R_i))^2}{n}$ ..... (4)

Rasio Sharpe, $\textbf{Sharpe} = \frac{R_i - R_f}{\sigma_i}$ ..... (5)

3. Results

This study conducted tests with a sample of 9 crypto assets. These 9 Crypto Assets have the largest capitalization value in the Crypto market, consisting of Bitcoin (BTC), Ethereum (ETH), Tether (USDT), BNB, XRP, Cardano (ADA), Dogecoin (DEGO), TRON (TRX), Litecoin (LTC). The selected data of Crypto asset is daily data from January 2018 to May 2022. Furthermore, the risk assessment is carried out using Value at Risk, Return, and Performance with the Sharpe method on a weekly period. Crypto Transaction Volume is seen from daily transaction data in each sample and weekly transaction average calculations are carried out which can be seen in Table 1.

Table 1. Descriptive Sample

Name	Status	VaR	Vol	Return	Sharpe
Bitcoin (BTC)	Before Covid 19	0.0011692	12,362,354,787	0.0007064	0.0197528
	Covid 19	0.0013997	39,576,625,044	0.0029234	0.0841740
Ethereum (ETH)	Before Covid 19	0.0018625	5,020,992,799	-0.0008138	-0.0259523
	Covid 19	0.0023974	20,788,898,210	0.0047457	0.1139625
Tether (USDT)	Before Covid 19	0.0000181	12,053,991,515	0.0000261	-0.0684657
	Covid 19	0.0000151	70,072,419,143	0.0000067	-1.1868804
BNB	Before Covid 19	0.0022130	152,228,817	0.0024226	0.0363881
	Covid 19	0.0035176	1,741,620,482	0.0059581	0.0935921
XRP	Before Covid 19	0.0020660	1,013,664,959	-0.0006033	-0.0659607
	Covid 19	0.0042656	4,680,937,783	0.0038328	0.0003515
Cardano (ADA)	Before Covid 19	0.0025396	98,694,197	-0.0012153	-0.0664191
	Covid 19	0.0033946	2,428,521,125	0.0057730	0.0684243
Dogecoin (DEGO)	Before Covid 19	0.0021668	35,346,299	0.0003984	-0.0708453
	Covid 19	0.0211762	2,173,468,582	0.0116966	-0.0411223
TRON (TRX)	Before Covid 19	0.0031146	493,543,554	0.0007028	-0.0228554
	Covid 19	0.0030122	1,680,457,195	0.0032342	0.0714395
Litecoin (LTC)	Before Covid 19	0.0022443	1,797,277,399	0.0003391	-0.0369595
	Covid 19	0.0027394	3,751,381,517	0.0021982	0.0595788

Source: data processed

Based on Table 1, it can be seen that crypto assets experienced an increase before COVID-19 until now. If we look at Bitcoin (BTC), the results show that the VaR value before COVID-19 was 0.0011692 and during COVID-19 was 0.0013997, these values mean that there was an increase in the level of risk during that period. Likewise, Transaction Volume has also increased three times compared to before the COVID-19 pandemic. These results show that during COVID-19 there were enthusiastic fluctuations from investors to make buying and selling Crypto transactions so that the COVID-19 pandemic did not become a strong issue for investors to be afraid to invest in Crypto assets. Crypto returns have increased four times compared to before COVID-19, the increase in returns was also supported by the performance of the Sharpe Ratio which also increased four times compared to before COVID-19. These conditions encourage investors to make

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portfolios of returns on Crypto assets as an investment in the Crypto market which is inevitable.

Table 2. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VaR-1 - VaR_2	-.00246	.06484	.00210	-.00657	.00166	-1.170	953	.242
Pair 2	Vol-1 - Vol_2	-1.90226	1.40363	.04544	-1.99144	-1.81308	-41.859	953	.000
Pair 3	return-1 - return_2	-.00237	.03662	.00119	-.00469	-.00004	-1.995	953	.046
Pair 4	Sharpe-1 - Sharpe_2	.05441	3.49365	.11311	-.16757	.27639	.481	953	.631

Source: data processed

The VaR variable is used as a risk measurement tool for price movements within a certain time. The results showed that there was no significant difference between the risk before COVID-19 and during COVID-19. While the Volume of Crypto Transactions experienced a significant difference before COVID-19 and during COVID-19. Crypto returns also experienced significant differences before COVID-19 and during COVID-19. Significant differences in Transaction Volume before COVID-19 and during COVID-19 are indicated by a sig value of 0.046 which is smaller than an alpha value of 0.05. Furthermore, the performance of Crypto which is calculated by the Sharpe Ratio does not show any significant difference before COVID-19 and during COVID-19 where the result of the sig value of 0.631 is greater than the alpha value of 0.05. These results show that Crypto asset activity can maintain stablecoins on investors' financial stability.

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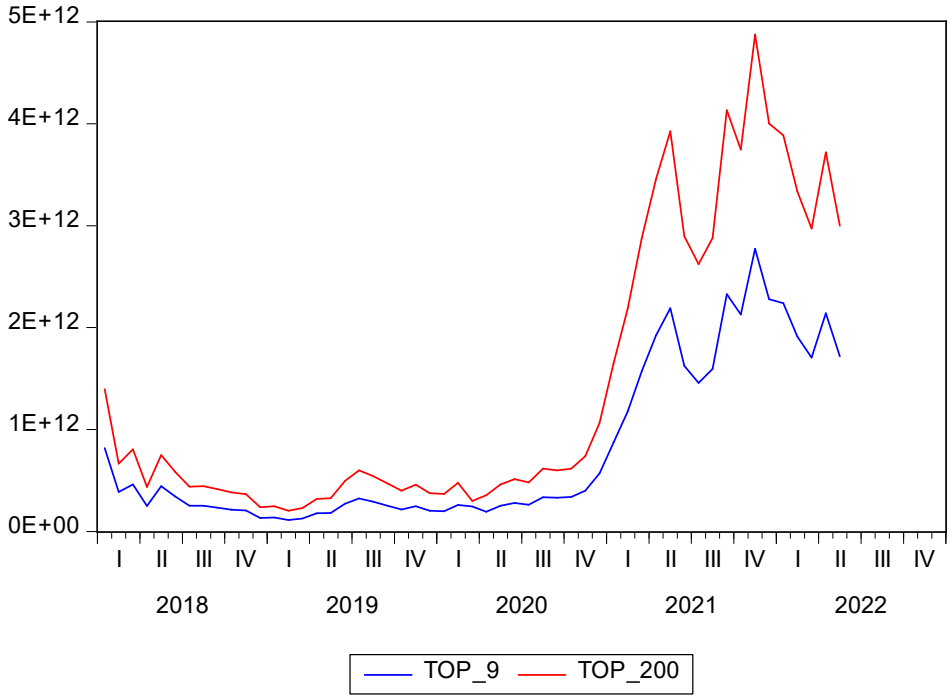

Figure 2. Crypto Capitalization Value

Crypto capitalization from 2018-2022 experienced a significant increase which can be seen in Figure 2. The movement of the capitalization value of the top 200 Crypto and 9 Crypto consistently increased from 2018-2022. The peak value of Crypto rose at the fourth period 2021. It indicates that despite the COVID-19 pandemic, Crypto is still victorious. The market capitalization value of the top 200 Cryptos is $41,817,750,558,486.50 and the top 9 Cryptos are $32,533,655,504,425.50. From these results, 78% of the value capitalization of the top 200 cryptocurrencies is represented by the top 9 cryptos used as samples in this study. So that if there is a decrease in these 9 cryptos, it will also have an impact on the overall capitalization value of crypto in the market.

Table 3. The Comparison of Crypto Capitalization

200 Top Crypto	9 Crypto	9 Crypto /200 Top
$ 41,817,750,558,486.50	$ 32,533,655,504,425.50	78%

Source: data processed

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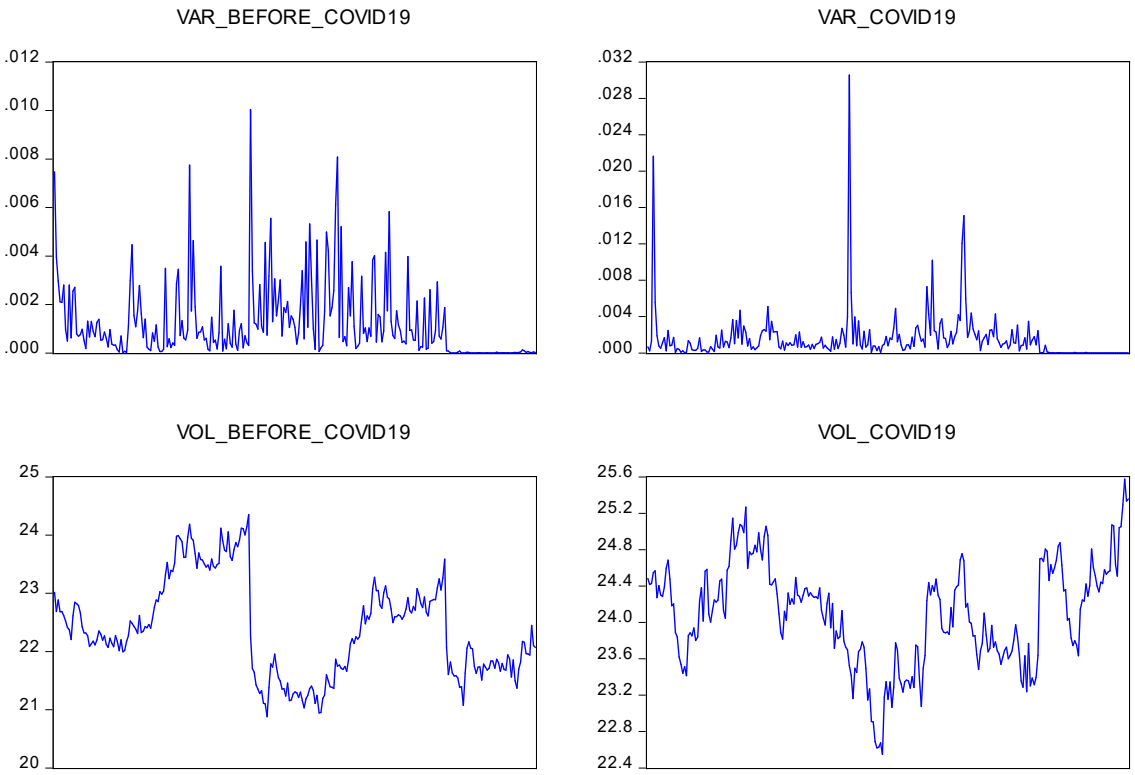

Figure 3. Risk and Transaction Volume

Volatile Crypto price movements will have an impact on high VaR values so that the risk is also high. As seen in Figure 3, in the VaR section there is an increase in risk during the COVID-19 period when compared to before COVID-19. Likewise, the volume of transactions has also increased. If there is no return on investment, it is impossible for people to be willing to invest in an asset. It can be seen in Figure 4 that there were different movements before COVID-19 and during COVID-19. After getting a return, then the performance of an asset can be calculated using the Sharpe Ratio. This study found that before COVID-19 Crypto performance was at -2 to 2.5 and during COVID-19 Sharpe Ratio performance was at -9 to 11. This result means that there is an improvement in Crypto performance during the COVID-19 period. However, there is no significant difference in Crypto assets within the two periods.

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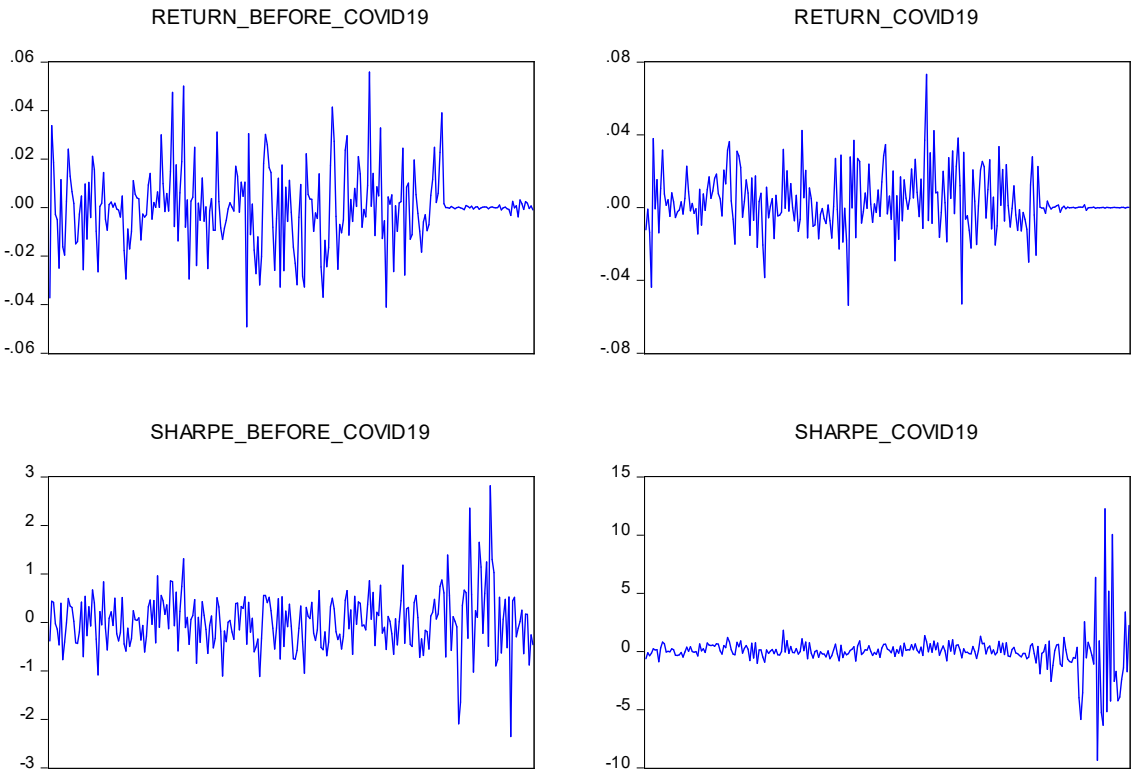

Figure 4. Return and Sharpe

4. Discussion

The rapid development of Cryptocurrency is a threat to the existing currency of money in the world. The threat has begun to be felt with the increasing number of Crypto transactions per day. The number of Crypto transactions beats the number of transactions in world currencies. The success of this Crypto lies in the efficiency of transactions breaking the chain of transactions between sellers-banks-customers to become sellers-customers. In the book entitled Bitcoin and Cryptocurrency Technologies that is written by Narayanan et al (2016), it is stated that there are 5 elements of strong stakeholders in the development of bitcoin.

First, Core Developers are people who develop the rules and codes used in the crypto transaction process. Second, Miners are people who carry out the mining process with the help of qualified software and hardware so that the coin mining process is more efficient. Third, Investors are people who buy and invest in certain crypto assets. Fourth, Merchants and their customers are people who process transactions using crypto coins for payment processing so that there is a demand for crypto coins which makes the price of crypto fluctuate. If investors who have crypto coins do not sell their coins, there will be a shortage of coins in the market so that the price of these coins will be high, thus the classical law of economics will occur. Fifth, Payment services are companies or individuals that become a forum for exchanging coins with currency or vice versa. Thus, Cryptocurrency can build a trust network as an alternative to investment independence.

The five elements of these stakeholders are the determinants of the sustainability of Cryptocurrencies in the future. Despite the number of advantages of cryptocurrencies, there are still many shortcomings, such as the absence of standard regulations governing the process of crypto transactions so that many countries are still hesitant to use crypto. Regulations will indeed hinder future crypto innovation, but these regulations will anticipate potential criminals that may arise in the future. Crypto is correlated with coins and tokens. Crypto coins come from blockchains that are interrelated with each other on

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other existing blockchains (Wu et al, 2018). The strength of cryptocurrency transactions is the existence of modern and more secure payment methods as described by Hendrickson et al (2016) and Urquhart (2016).

This study has similarities with the research of Gatabazi et al (2022) which examined the crypto life cycle in the 2013-2017 and 2009-2013 periods, the results show that in the 2013-2017 period crypto has a high risk where many cryptos live and die in that period when compared to the 2009-2013 period. This study has similarities in the form of comparison of the effects of certain events in different periods. So, this result shows that investors need to be vigilant in choosing the type of crypto that is safe from the threat of death. Types of cryptocurrencies that were popular in the period of 2009-2017 according to Gatabazi et al (2022) namely Litecoin (2011), Peercoin (2012), Ripple (2012), Alphacoin (2013–2014) and Aircoin (2014–2016). In 2021, new types of crypto are starting to come in, such as Bogged Finance (2021) and Recharge Finance (2020). Currently in 2022, according to coinmarketcap, over 9000 cryptos have sprung up like grass in the spring. The high death rate of crypto poses a threat to investors' confidence in crypto.

Due to the large number of cryptos that have died, many countries have banned digital money market transactions (Hendrickson et al, 2016). There are several countries that legalize Crypto transactions, such as El Salvador, Panama, Brazil, Paraguay, Mexico, and Argentina (https://www.newcapital.com/, 2021). Countries that legalize crypto are developing countries. Rising crypto prices marked by a high number of transactions were hindered by COVID-19. It has implications for cryptocurrency trading globally (Youssef et al, 2021). COVID-19 has had an impact on financial markets because there is no certainty over economic policies. It causes cash flow disruption due to stock market depreciation (Azimli, 2020). The results of studies of Youssef et al (2021) and Azimli (2020) are refuted by this study, because there is no significant difference between return and transaction volume before and during COVID-19, there is even an increase in Crypto market capitalization during COVID-19. Crypto market capitalization, both in the absence of a pandemic and during the COVID-19 pandemic, can increase investors' confidence in seeking funding sources and increase crypto trading liquidity in limited markets. Therefore, fluctuations in confidence in crypto are driving alternative coins created by investors to carry out Initial Coin Offerings (ICOs) to the market.

The test of differences in returns on the composition of funds on stocks in different portfolios with the same sample was also carried out by Kristanti et al (2022). The results prove that the same sample will have different returns, and different portfolio risks. So, this result can be a reference for further research to combine different types of crypto with the aim of getting the maximum return by adjusting the precise composition of funds. There is a well-known saying in investing, namely “don't put all your eggs in one basket”. Investing in crypto has a high risk, so it is necessary to diversify by combining several assets that have low risk such as investing in gold, deposits, stocks, currency, and assets in the form of land. The process of portfolio diversification can be seen in research that has been carried out in Indonesia such as the one from Hendrawan and Salim (2017) that examined Tobins'q portfolio on the Kompas 100 index stock in Indonesia.

Other studies were also conducted by Salim (2019) with the object of stock portfolios on the Islamic index in Indonesia, Salim et al (2020) regarding the optimal currency portfolio, Waspada and Salim (2020) regarding the ASEAN index portfolio, Salim and Rizal (2021) regarding optimal portfolio beta and alpha, Waspada et al (2021) regarding the smart beta portfolio model in the Indonesian stock market. Thus, among the many portfolio models that have been studied, it is back to investors what model they are interested in and understand, each model has advantages and disadvantages. So it is appropriate for this law to act like the saying "where the earth is stepped on, there the sky is upheld" or "other ponds have different fish". This term means that investors in managing investments must first understand which investments to invest, then they must know what level of risk and return they want so that they can set the strategy what will be done.

5. Conclusions

COVID-19 made the world economy decline which was marked by the decline in several stock indices, commodity prices, and world currencies. The decline was caused by investors' doubts about the economic instability caused by COVID-19. This declining condition did not affect the Cryptocurrency market. Cryptocurrency experienced significant market cap growth before and during the pandemic. The 9 top cryptos studied in this study represent 78% of the capitalization value of the top 200 crypto assets on the market. The comparison of paired t-test was carried out on the level of risk, transaction volume, return, and performance of the Sharpe Ratio. The results of this study indicate that there is no significant difference in the risk and performance of the Sharpe Ratio before and during COVID-19. Meanwhile, return and transaction volume have significant differences before and during COVID-19. The results of this study indicate that despite COVID-19, investors' desire to make transactions on crypto assets is not affected.

In contrast to other investment assets such as stocks, commodities and currencies. Crypto provides a high rate of return so that many investors are interested in making transactions and the volume of transactions increases. While the level of risk and performance of the Sharpe Ratio did not show a significant difference in the results of this study because crypto assets experienced high price fluctuations in every trade both before and during COVID-19. Sharpe Ratio Performance is Crypto performance that is subtracted by risk free then divided by Crypto standard deviation. The results of this study indicate that Crypto asset activity can maintain stablecoins on investors' financial stability. The risk free used in this study is the price of gold commodity which is stable from time to time and tends to increase, divided by the high standard deviation of crypto as reflected by the rapid price exchange at a certain time. Thus, the higher the standard deviation of an asset, the smaller the value of the Sharpe Ratio performance. Furthermore, the absence of a clear underlying asset for crypto assets at this time makes investors who are established and have large funds afraid to enter crypto investments. Today many people think crypto transactions are a gamble, not an investment. In the future, crypto is a digital money exchange instrument that is more transparent, efficient, difficult to duplicate, so that it becomes an alternative to replace the current conventional exchange instrument.

References

Aalborg, H., Molnár, P., & de Vries, J. E. (2018). What can explain the price, volatility and trading volume of Bitcoin? *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3233977

Ante, L., Fiedler, I., von Meduna, M., & Steinmetz, F. (2020). Returns from investing in cryptocurrency: Evidence from German individual investors. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3540876

Ayedh, A., Echchabi, A., Battour, M., & Omar, M. (2020). Malaysian Muslim investors' behaviour towards the block-chain-based Bitcoin cryptocurrency market. *Journal of Islamic Marketing*, 12(4), 690–704. https://doi.org/10.1108/jima-04-2019-0081

Azimli, A. (2020). The impact of covid-19 on the degree of dependence and structure of risk-return relationship: A quantile regression approach. *Finance Research Letters*, 36, 101648. https://doi.org/10.1016/j.frl.2020.101648

Baur, D. G., Hong, K. H., & Lee, A. D. (2018). Bitcoin: Medium of exchange or speculative assets? *Journal of International Financial Markets*, Institutions and Money, 54, 177–189. https://doi.org/10.1016/j.intfin.2017.12.004

Bianchi, D., & Babiak, M. (2020). On the performance of cryptocurrency funds. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3559092

Bouri, E., Gupta, R., Tiwari, A. K., & Roubaud, D. (2017). Does bitcoin hedge global uncertainty? evidence from wavelet-based quantile-in-quantile regressions. *Finance Research Letters*, 23, 87–95. https://doi.org/10.1016/j.frl.2017.02.009

Bouri, E., Molnár, P., Azzi, G., Roubaud, D., & Hagfors, L. I. (2017). On the hedge and safe haven properties of bitcoin: Is it really more than a diversifier?. *Finance Research Letters*, 20, 192–198. https://doi.org/10.1016/j.frl.2016.09.025

Bouri, E., Shahzad, S. J., & Roubaud, D. (2019). Co-explosivity in the cryptocurrency market. *Finance Research Letters*, 29, 178–183. https://doi.org/10.1016/j.frl.2018.07.005

Brière, M., Oosterlinck, K., & Szafarz, A. (2015). Virtual currency, tangible return: Portfolio diversification with bitcoin. *Journal of Asset Management*, 16(6), 365–373. https://doi.org/10.1057/jam.2015.5

Cheah, E.-T., & Fry, J. (2015). Speculative bubbles in bitcoin markets? an empirical investigation into the fundamental value of Bitcoin. *Economics Letters*, 130, 32–36. https://doi.org/10.1016/j.econlet.2015.02.029

Ciaian, P., Rajcaniova, M., & Kancs, d'A. (2016). The digital agenda of virtual currencies: Can bitcoin become a global currency?. *Information Systems and e-Business Management*, 14(4), 883–919. https://doi.org/10.1007/s10257-016-0304-0

Corbet, S., Lucey, B., & Yarovaya, L. (2018). Datestamping the bitcoin and Ethereum Bubbles. *Finance Research Letters*, 26, 81–88. https://doi.org/10.1016/j.frl.2017.12.006

Demir, E., Gozgor, G., Lau, C. K., & Vigne, S. A. (2018). Does economic policy uncertainty predict the bitcoin returns? an empirical investigation. *Finance Research Letters*, 26, 145–149. https://doi.org/10.1016/j.frl.2018.01.005

Dyhrberg, A. H. (2016). Bitcoin, Gold and the dollar – A GARCH volatility analysis. *Finance Research Letters*, 16, 85–92. https://doi.org/10.1016/j.frl.2015.10.008

El Salvador legalises bitcoin: Hype or breakthrough? - EFGAM new capital. EFG. (n.d.). Retrieved July 15, 2022, from https://www.newcapitalfunds.com/insights/Infocus-El-Salvador.html

Enoksen, F. A., Landsnes, C. J., Lučivjanská, K., & Molnár, P. (2020). Understanding Risk of Bubbles in Cryptocurrencies. *Journal of Economic Behavior & Organization*, 176, 129–144. https://doi.org/10.1016/j.jebo.2020.05.005

Fry, J., & Cheah, E.-T. (2016). Negative bubbles and shocks in cryptocurrency markets. *International Review of Financial Analysis*, 47, 343–352. https://doi.org/10.1016/j.irfa.2016.02.008

Gatabazi, P., Kabera, G., Mba, J. C., Pindza, E., & Melesse, S. F. (2022). Cryptocurrencies and tokens lifetime analysis from 2009 to 2021. *Economies*, 10(3), 60. https://doi.org/10.3390/economies10030060

Grinberg, R. (2012). Bitcoin: An Innovative Alternative Digital Currency. *Hastings Science and Technology Law Journal*, 4(1).

Hendrickson, J. R., Hogan, T. L., & Luther, W. J. (2016). The political economy of bitcoin. *Economic Inquiry*, 54(2), 925–939. https://doi.org/10.1111/ecin.12291

Hendrawan, R., Salim, D. F. (2017). Optimizing Active and Passive Stocks Portfolio Formed Tobin's Q and Price Earning Ratio Model Stocks on Kompas Index-100 Period 2012-2017. *Internasional Jurnal of Applied Busisness and Economic Reseach*, 15(26), 625–641.

Ji, Q., Bouri, E., Lau, C. K., & Roubaud, D. (2019). Dynamic connectedness and integration in cryptocurrency markets. *International Review of Financial Analysis*, 63, 257–272. https://doi.org/10.1016/j.irfa.2018.12.002

Krische, S. D. (2019). Investment experience, Financial Literacy, and investment-related judgments. *Contemporary Accounting Research*, 36(3), 1634–1668. https://doi.org/10.1111/1911-3846.12469

Kristanti, F. T., Salim, D. F., Indrasari, A., Aripin, Z. (2022). A stock portfolio strategy in the midst of the COVID-19: Case of Indonesia. *Journal of Eastern European and Central Asian Research (JEECAR)*. 9(3), 422–431. https://doi.org/10.15549/jeecar.v9i3.822

Lammer, D., Hanspal, T., & Hackethal, A. (2020). Who are the bitcoin investors? evidence from indirect cryptocurrency investments. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3501549

Li, N., & Qian, Y. (2018). The impact of educational pairing and urban residency on household financial investments in urban China. *Journal of Family and Economic Issues*, 39(4), 551–565. https://doi.org/10.1007/s10834-018-9579-2

Li, Y., Zheng, Z., & Dai, H.-N. (2020). Enhancing bitcoin price fluctuation prediction using attentive LSTM and embedding network. *Applied Sciences*, 10(14), 4872. https://doi.org/10.3390/app10144872

Munnukka, J., Uusitalo, O., & Koivisto, V.-J. (2017). The consequences of perceived risk and objective knowledge for consumers' investment behavior. *Journal of Financial Services Marketing*, 22(4), 150–160. https://doi.org/10.1057/s41264-017-0033-6

Narayanan, A. (2016). *Bitcoin and cryptocurrency technologies: A comprehensive introduction*. Published by Princeton University Press, 41 William Street, Princeton, New Jersey 08540. ISBN 978-0-691-17169-2.

Ong, B., Lee, T. M., Li, G., & Chuen, D. L. E. E. (2015). Evaluating the potential of alternative cryptocurrencies. *Handbook of Digital Currency*, 81–135. https://doi.org/10.1016/b978-0-12-802117-0.00005-9

Phillips, P. C., Shi, S., & Yu, J. (2015). Testing for multiple bubbles: Historical episodes of exuberance and collapse in the S&P 500. *International Economic Review*, 56(4), 1043–1078. https://doi.org/10.1111/iere.12132

Salim, D. F., Rizal, N. A. (2021). Portofolio optimal Beta dan Alpha. *Jurnal Riset Akuntansi Dan Keuangan*, 9(1), 181–192. https://doi.org/10.17509/jrak.v9i1.27586

Salim, D. F. (2019). Perancangan Portofolio Optimal Dengan Mengunakan Return On Assets, Return On Equity Dan Economic Value Added Pada Indeks Jakarta Ismaic Index Periode 2014-2018. *Jurnal Riset Akuntansi Dan Keuangan*, 7(1), 43–54. https://doi.org/10.17509/jrak.v7i1.15470

Salim, D. F. (2019). Perancangan Portofolio Optimal Dengan Mengunakan Return On Assets, Return On Equity Dan Economic Value Added Pada Indeks Jakarta Ismaic Index Periode 2014-2018. *Jurnal Riset Akuntansi Dan Keuangan*, 7(1), 43–54. https://doi.org/10.17509/jrak.v7i1.15470

Urquhart, A. (2016). The inefficiency of Bitcoin. *Economics Letters*, 148, 80–82. https://doi.org/10.1016/j.econlet.2016.09.019

Wang, G.-J., Xie, C., Wen, D., & Zhao, L. (2019). When bitcoin meets economic policy uncertainty (EPU): Measuring risk spillover effect from EPU to bitcoin. *Finance Research Letters*, 31. https://doi.org/10.1016/j.frl.2018.12.028

Waspada, I., Salim, D. F. (2020). Smart Beta in Index Country ASEAN. *European Journal of Molecular Clinical Medicine*, 7(11), 906–918.

Waspada, I. P., Salim, D. F., & Fariska, P. (2021). An Application of the Smart Beta Portfolio Model: An Empirical Study in Indonesia Stock Exchange. *The Journal of Asian Finance, Economics and Business*, 8(9), 45–52. https://doi.org/10.13106/JAFEB.2021.VOL8.NO9.0045

Wu, K., Wheatley, S., & Sornette, D. (2018). Classification of cryptocurrency coins and tokens by the dynamics of their market capitalizations. *Royal Society Open Science*, 5(9), 180381. https://doi.org/10.1098/rsos.180381

Wu, S., Tong, M., Yang, Z., & Derbali, A. (2019). Does gold or bitcoin hedge economic policy uncertainty?. *Finance Research Letters*, 31, 171–178. https://doi.org/10.1016/j.frl.2019.04.001

Xi, D., O'Brien, T. I., & Irannezhad, E. (2020). Investigating the investment behaviors in cryptocurrency. *The Journal of Alternative Investments*, 23(2), 141–160. https://doi.org/10.3905/jai.2020.1.108

Xiao, H., Xiong, X., & Chen, W. (2021). Introduction to the special issue on impact of COVID-19 and cryptocurrencies on the Global Financial Market. *Financial Innovation*, 7(1). https://doi.org/10.1186/s40854-021-00244-2

Yermack, D. (2015). Is bitcoin a real currency? an economic appraisal. Handbook of Digital Currency, 31–43. https://doi.org/10.1016/b978-0-12-802117-0.00002-3

Yilmaz, N. K., & Hazar, H. B. (2018). Predicting future cryptocurrency investment trends by Conjoint Analysis. *Pressacademia*, 5(4), 321–330. https://doi.org/10.17261/pressacademia.2018.999

Youssef, M., Mokni, K., & Ajmi, A. N. (2021). Dynamic connectedness between stock markets in the presence of the COVID-19 pandemic: Does economic policy uncertainty matter?. *Financial Innovation*, 7(1). https://doi.org/10.1186/s40854-021-00227-3

Zhao, H., & Zhang, L. (2020). Talking money at home: The value of family financial socialization. *International Journal of Bank Marketing*, 38(7), 1617–1634. https://doi.org/10.1108/ijbm-04-2020-0174