THE EFFECT OF TECHNICAL ASSET, FINANCIAL ASSET AND MACRO-ECONOMIC ON RETURN BITCOIN

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Abstract
This study uses research variables such as Trading Volume, Market Capitalization, S&P 500 Index, World Oil Price, Gold Price on Bitcoin Returns. The data source in this study is through internet media with the sites https://coinmarketcap.com/, https://finance.yahoo.com/, and other sites that support this research. The data used in this study are time series, and the target population for the data sample is 1,096 (3 years x 365) daily report data. The data were collected from January 1, 2020, to December 31, 2022, through the release of daily bitcoin transaction reports. Time series data analysis using Engel Granger's Error Correction Model is the method employed (ECM). The analysis tool used is the Econometric Views (Eviews) which is one of the computer econometric program. The results of this study where trading volume has a positive and insignificant effect on bitcoin returns. The impact of market capitalisation on bitcoin returns is both favorable and significant. Returns on bitcoin are positively and significantly impacted by S&P 500. The returns on bitcoin are negatively and insignificantly impacted by the price of world oil. Returns on bitcoin are positively and negligibly impacted by the gold price.

Keywords : Trading Volume, Market Capitalization, S&P 500 Index, World Oil Price, Gold Price, Bitcoin Returns, Engel Granger's Error Correction Model (ECM), Econometric Views (Eviews)

1. INTRODUCTION
Since it is launched in 2009, cryptocurrency has become increasingly popular around the world. It has attracted so much attention from both regulators, the public, and investors due to its unique characteristic, possessing properties of both standard financial assets and speculative assets (Kristoufek, 2015).

Bitcoin is one of the digital currencies, which also comprises cryptocurrencies. Despite being a form of alternative currency, Bitcoin is also employed as a financial tool (Baur et al., 2018). A person using the alias Satoshi Nakamoto created Bitcoin in 2008 and made it known to the world in 2009. (Kurihara & Fukushima, 2018).

The highly volatile returns of bitcoin and most other cryptocurrencies attract speculators who hope to sell the digital assets, which they have bought now, at a higher price later. Figure 1.1 below illustrates the development of bitcoin (BTC) returns from 2009-2022.
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The technical asset factor variables used in research to capture the influence of the bitcoin market itself are market capitalization and trading volume on bitcoin returns (Bakas et al., 2022).

Furthermore, the financial asset factor variable, this study uses the price of the United States stock market index (S&P 500 index closing price). The index is based because the United States stock market is considered a representative measure of the performance of equity markets around the world (Bardgett et al., 2019).

Macro-economic variables are believed to largely have an impact on the cryptocurrency market. Therefore, the author includes world oil prices, and gold prices in the research model because they have the characteristics of both rare and expensive assets and can be used as an alternative safe investment instrument (safe heaven) when the bitcoin market is falling (Baur, 2018).

Based on previous studies above, most of the literature recognizes that the cryptocurrency market is increasingly efficient, characterized by great market interest. So this study uses research variables such as Trading Volume, Market Capitalization, S&P 500 Index, World Oil Prices, Gold Prices on Bitcoin Returns.

2. LITERATURE REVIEW

2.1. Trading Volume

Trading volume is the number of active trades on a coin at any given time. In general, the greater the trading volume, it indicates that the better the cryptocurrency asset is because it makes the asset easier to trade (coinvest, 2021).

2.2. Market Capitalization

Market capitalization, often known as market cap, is a metric or a measure that represents the market worth of an item. The value of different digital assets, such as stocks or cryptocurrencies, is measured and calculated using market capitalization (Sihombing S et al, 2021).

2.3. Return bitcoin

Return is the rate of profit obtained by investors on the investment made. It can be concluded that return is the result obtained from investment (Umam and Herry, 2017: 182).
2.4. S&P 500 Index
The S&P 500 is one of the indices that is a leading indicator of the movement of the US stock market. It contains 500 stocks issued by 500 major issuers. Meanwhile, the S&P 500 Index variable is used by Gunasekarage et al. (2004) as a proxy for global macroeconomic variables to explain Index price movements. Gunasekarage et al. (2004) revealed that much of the literature suspects that the capital market in the United States exerts a significant influence on most capital markets in the world.

2.5. World Oil Price
The West Texas Intermediate (WTI) crude oil price, also referred to as light sweet oil, is the benchmark for the global price of oil. According to research by Dennis van Wijk (2013), Analysis of the effect of oil prices on the value of bitcoin, long-term fluctuations in world oil prices, specifically, have the power to influence Bitcoin's price.

2.6. Gold Price
Gold is a form of investment that tends to be risk-free (Sunariyah, 2006). The limited amount of gold makes its price always increase in the long run. Similarly, bitcoin has a limited supply.

3. CONCEPTUAL FRAMEWORK AND HYPOTESIS
3.1. Conceptual Framework
So this study uses research variables such as Trading Volume, Market Capitalization, S&P 500 Index, World Oil Prices, Gold Prices on Bitcoin Returns. The conceptual framework in this study can be seen as follows:

![Conceptual Framework Diagram](image)

3.2. Hypothesis
1. The amount of trading has a favorable and large impact on bitcoin return.
2. Market capitalization significantly and favorably influences bitcoin return.
3. Bitcoin return are negatively and significantly impacted by the S&P 500 index.
4. The return on bitcoin are significantly and negatively impacted by global oil prices.
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5. The return on bitcoin is significantly and negatively impacted by the price of gold.
6. The amount of trading has a favorable and large impact on bitcoin returns.
7. Market capitalization significantly and favorably influences bitcoin returns.

4. RESEARCH METHOD

This research uses a quantitative approach that uses numbers, statistical processing with the aim of testing predetermined hypotheses (Sugiyono, 2016). So this research will be able to describe how the relationship between technical assets, financial assets and macro-economics on bitcoin returns.

The sites https://coinmarketcap.com/, https://finance.yahoo.com/, and other research-supporting websites were used to perform this study in Indonesia. The type of data used in this study is time series data, which was gathered from a target population of 1,096 (3 years x 365) daily report data for the sample data from January 2020 to December 2022 through documentation research on the release of daily bitcoin transaction reports.

The data analysis used is time series data analysis with Engel Granger's Error Correction Model (ECM). The analysis tool used is the Econometric Views (Eviews) which is one of computer econometric program.

5. RESULT AND DISCUSSION

5.1. Descriptive Statistics

The research period from January 1, 2020 to December 31, 2022 resulted in 1096 observations. The results of descriptive analysis in this study are as follows:

<table>
<thead>
<tr>
<th></th>
<th>RETURN</th>
<th>TRADE_VOL</th>
<th>MARKET_CAP</th>
<th>SNP</th>
<th>WTI</th>
<th>GOLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.0014</td>
<td>3.67E+10</td>
<td>5.44E+11</td>
<td>3863.528</td>
<td>3.9095</td>
<td>1790.601</td>
</tr>
<tr>
<td>Median</td>
<td>0.0008</td>
<td>3.30E+10</td>
<td>4.46E+11</td>
<td>3916.015</td>
<td>3.7100</td>
<td>1795.750</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.1874</td>
<td>3.51E+11</td>
<td>1.27E+12</td>
<td>4889.170</td>
<td>9.3200</td>
<td>2051.500</td>
</tr>
<tr>
<td>Minimum</td>
<td>-0.3717</td>
<td>9.74E+09</td>
<td>9.08E+10</td>
<td>2237.400</td>
<td>1.0900</td>
<td>1442.400</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.0379</td>
<td>1.89E+10</td>
<td>3.23E+11</td>
<td>551.7150</td>
<td>1.6387</td>
<td>102.468</td>
</tr>
<tr>
<td>Observations</td>
<td>1096</td>
<td>1096</td>
<td>1096</td>
<td>1096</td>
<td>1096</td>
<td>1096</td>
</tr>
</tbody>
</table>

Source: Output Eviews (2023)

The return on bitcoin is significantly and negatively impacted by the price of gold.

The amount of trading has a favorable and large impact on bitcoin returns.

Market capitalization significantly and favorably influences bitcoin returns.
5.2. Stationarity Test

The use of non-stationary data requires special treatment to avoid spurious regression where an estimated regression equation has good significance, but is essentially meaningless. The Augmented Dickey Fuller test is utilized by the unit root test (ADF test). The study's variables demonstrate that the data are not level-stationary. To check for stationarity, the data must be differenced once.

Tabel 5.2 Stationarity Test Results

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Stationer Test on Level</th>
<th>Probability</th>
<th>Stationerity</th>
<th>Stationer Test on First Different</th>
<th>Probability</th>
<th>Stationerity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return Bitcoin</td>
<td></td>
<td>0.0000</td>
<td>Stationer</td>
<td>0.0000</td>
<td>Stationer</td>
<td></td>
</tr>
<tr>
<td>Trading Volume</td>
<td></td>
<td>0.0002</td>
<td>Stationer</td>
<td>0.0000</td>
<td>Stationer</td>
<td></td>
</tr>
<tr>
<td>Market Capitalization</td>
<td>0.5543</td>
<td>Non Stationer</td>
<td>0.0000</td>
<td>Stationer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indeks S&amp;P 500</td>
<td>0.4121</td>
<td>Non Stationer</td>
<td>0.0000</td>
<td>Stationer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>World Oil Price</td>
<td>0.1811</td>
<td>Non Stationer</td>
<td>0.0000</td>
<td>Stationer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gold Price</td>
<td>0.0089</td>
<td>Stationer</td>
<td>0.0000</td>
<td>Stationer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Output Eviews (2023)

5.3. Cointegration Test

The test developed by Johansen can be used to determine the cointegration of a number of variables (Unrestricted Cointegration Rank Test Trace). A long-term link between the independent variable and the dependent variable is examined by the cointegration test.

Based on the results above, it indicates 2 cointegration with trace statistic value > critical value which means that cointegration occurs. Then the tested equation has a long-term relationship.

5.4. Classical Assumption Test

According to the findings of the multicollinearity testing, there are no signs of multicollinearity between the independent variables. The VIF value is 10, which is why (Ghozali, 2013).

The Harvey test can be used to determine whether heteroscedasticity exists. It may be concluded that there is no heteroscedasticity issue based on the data processing results of the heteroscedasticity test, where the value is more than = 5% and the chi-square probability of Obs * R-Squared is 0.8460.

The short-term equation did not exhibit autocorrelation symptoms, as indicated by the Obs * R-Squared probability value of 0.8296, which was calculated based on the results, and which is more than the level of significance = 5%.
5.5. Regression Test Error Correction Model

**Tabel 5.3 Tabel Regresi Error Correction Model**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>D(TRADE_VOL)</td>
<td>6.06E-14</td>
<td>0.781321</td>
<td>0.4348</td>
</tr>
<tr>
<td>D(MARKET_CAP)</td>
<td>1.37E-12</td>
<td>24.72541</td>
<td>0.0000</td>
</tr>
<tr>
<td>D(SNP)</td>
<td>9.01E-05</td>
<td>3.339664</td>
<td>0.0009</td>
</tr>
<tr>
<td>D(WTI)</td>
<td>-0.001236</td>
<td>-0.204302</td>
<td>0.8382</td>
</tr>
<tr>
<td>D(GOLD)</td>
<td>1.51E-05</td>
<td>0.219688</td>
<td>0.8262</td>
</tr>
<tr>
<td>RESID01_ECT(-1)</td>
<td>-0.248101</td>
<td>-8.416260</td>
<td>0.0000</td>
</tr>
<tr>
<td>C</td>
<td>-0.000268</td>
<td>-0.209478</td>
<td>0.8341</td>
</tr>
</tbody>
</table>

The form of the research regression analysis equation is as follows:

\[ dY = -0.0002568 + 6.06edX1 + 1.37edX2 + 9.01edX3 - 0.001236dX4 + 1.51edX5 - 0.248101ECT(-1) \mu \]

Description:
- d(Y) = First different Return Bitcoin
- dX1 = First different Trading Volume
- dX2 = First different Market Capitalization
- dX3 = First different variabel S&P 500 Index
- dX4 = First different World Oil Price
- dX5 = First different Gold Price
- ECT = Residual Variabel From Long-term Regretion
- \( \mu \) = Residual value

5.6. Discussion of Research Results

According to the findings of this study, at a significance level of 5%, Trade Volume has a negative and minor impact on Bitcoin Return. The findings of this study are consistent with those of studies by Dimitrios Bakas, Georgios Magkonis, Eun Young Oh, and Priti Dubey (2022), which found a positive and substantial relationship between trading volume and bitcoin returns. Nevertheless, this runs counter to the findings of a 2014 study by Glaser, Zimmermann, et al., which claim that volume has no bearing on returns but instead reveals useful data on Bitcoin trading activity that supports the idea of cryptocurrency as a volatile financial asset.

According to the findings of this study, at a significance level of 5%, Market Capitalization has a favorable and significant impact on Bitcoin Returns. The findings of this analysis concur with those of studies by Dubey (2022), Sovbetov (2018), Momtaz (2021), and Bakas et al (2022), which discovered a highly substantial positive link between market capitalization and bitcoin returns. This, however, goes against the findings of Shen et al. (2020) and Adriansyah & Fachrudin (2021), who claimed that Market Capitalization had little to no impact on bitcoin returns.
The S&P 500 Index has a favorable and substantial impact on Bitcoin Returns at the = 5% significance level, according to the findings of this study. The findings of this analysis are consistent with those of studies by Bakas (2022), Ünvan, (2021), Sovbetov (2018, Kjaereland et al (2018), and Canoz & Dirican (2017), who discovered a substantial inverse association between the returns on the S&P 500 Index and those of bitcoin. This, however, contradicts claims made by Poyser and Perdiguero (2017) and Gil-Alana et al. (2020) that the S&P 500 Index significantly boosts bitcoin returns.

According to the findings of this study, the Global Oil Price has a small negative impact on Bitcoin returns. The findings of this analysis are consistent with those of Poyser and Perdiguero's (2017) study, and Panagiotidis et al.2018 .’s study discovered a substantial inverse association between bitcoin returns and world oil prices. Adebola et al. (2019), who claim that the Global Oil Price had little to no impact on bitcoin returns, are in disagreement with this.

According to the findings of this study, at a significance level of 5%, the Gold Price has a positive but small impact on Bitcoin Return. The study's findings concur with those of Oey Laurensia Dewi Warsito, who found that pricing has no bearing on bitcoin returns. Yet, Priti Dubey's research from 2022 indicates that the price of gold has a negative impact on the returns of bitcoin.

6. CONCLUSION AND RECOMMENDATIONS
6.1. Conclusions

The following can be drawn as a conclusion from the research and discussion's findings:
1. The amount of trading has a small but positive impact on bitcoin return.
2. Market capitalization significantly and favorably influences bitcoin return.
3. Bitcoin return are significantly and favorably impacted by S&P 500.
4. The return on bitcoin are negatively and insignificantly impacted by global oil prices.
5. Bitcoin return are positively and negligibly impacted by the gold price.

6.2. Recommendations

Following are some recommendations that can be made based on the findings of the research:
1. Since the research's findings indicate that the bitcoin supply variable has a favorable impact on returns, it is hoped that the company will be able to keep the price of bitcoin stable. A falling price indicates a decline in demand for bitcoin, and consistent production of coins will increase demand and encourage more investors to purchase bitcoin.
2. The results showed that the miner revenue variable had a negative effect on bitcoin returns, so it is hoped that investors before starting mining, should calculate potential profits using one of the crypto mining profitability calculators that can be done online and join a mining pool which contains a group of miners who work together and share rewards. Individual miners can join mining pools to compete with mining farms. This can speed up the mining process, while lowering the difficulty of mining, making it more profitable and rewarding.
3. The results showed that the S&P 500 variable and world oil prices had a positive influence on bitcoin returns, it is hoped that the company will continue to maintain the stability of the bitcoin price so that investors do not divert their investments to other markets.
4. The results showed that the market capitalization variable had a positive effect on bitcoin returns, it is hoped that the company can strengthen assets and is not vulnerable to market
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manipulation by a group of people who use pump and dump schemes, so as to increase transactions which indicate that public confidence in bitcoin is increasing and keep asset capitalization higher, so that when the market capitalization of bitcoin increases, it will have an attraction for investors and trigger positive sentiment leading to increased demand among investors which shows positive prospects for future assets.

5. The results showed that the variables of World Oil Price, Gold price and trading volume did not have an influence on bitcoin returns, it is hoped that companies can evaluate in justifying other variables because there are several variables that do not have a significant effect on bitcoin returns, one of which is the variable world oil price, gold price and trading volume so that other variables can be considered to increase bitcoin returns.

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