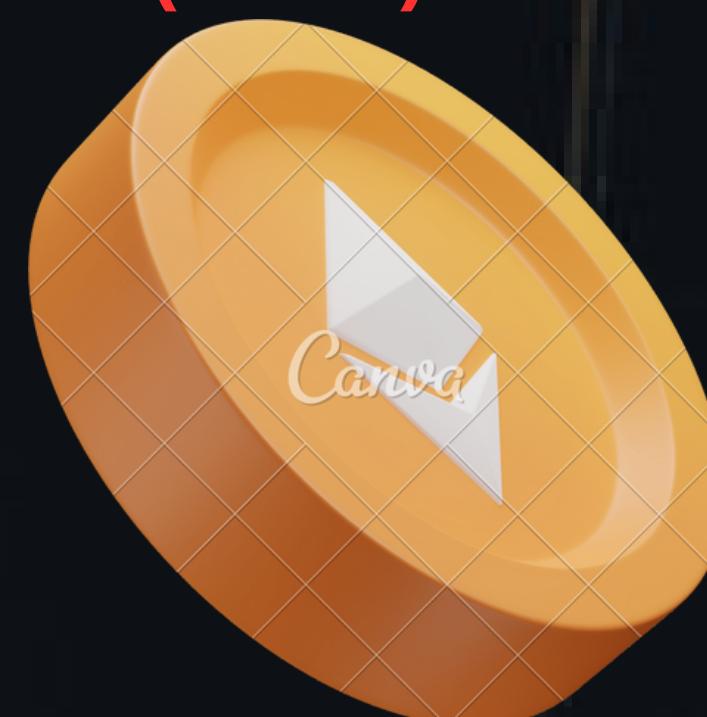
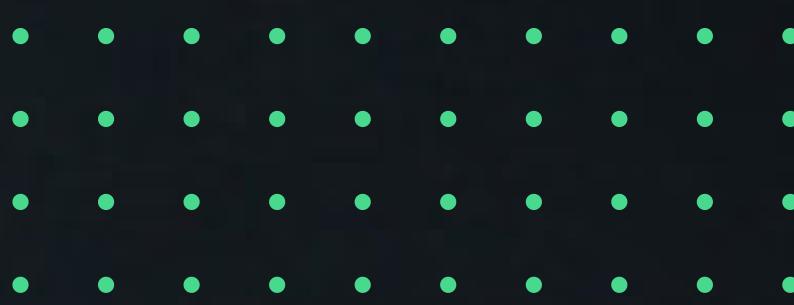


# Quant Trading Analysis

BTC - ETH - XRP

2017(DEC) - 2023(SEP)

By MUFIN

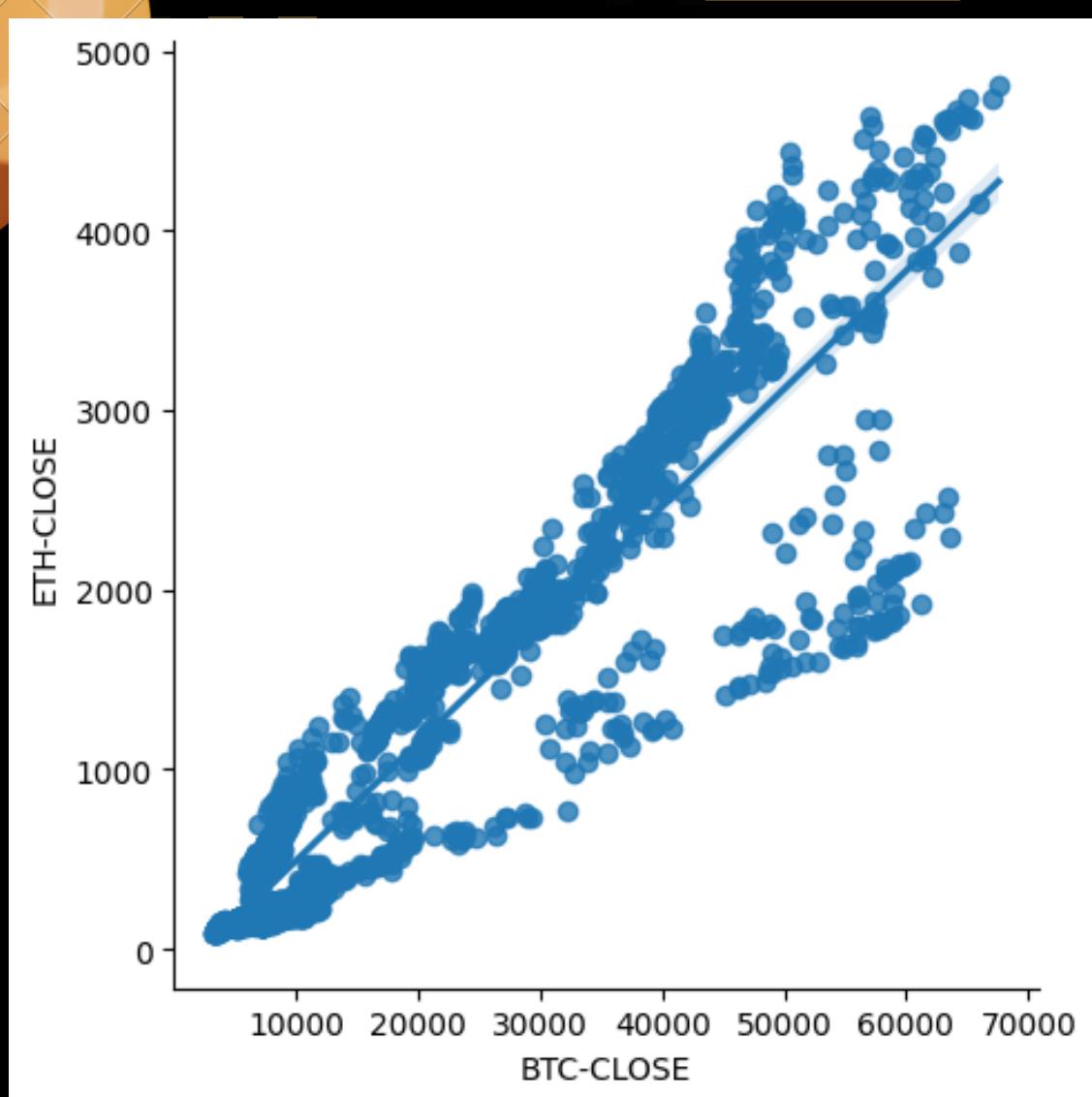


# BITCOIN PRICE IMPACT

Everyone always assumes that Bitcoin is the compass for cryptocurrencies, that Bitcoin will always influence the direction the market will move (bull/bear). But will it always be that way? What if this were to be proven based on Bitcoin's data and history...?

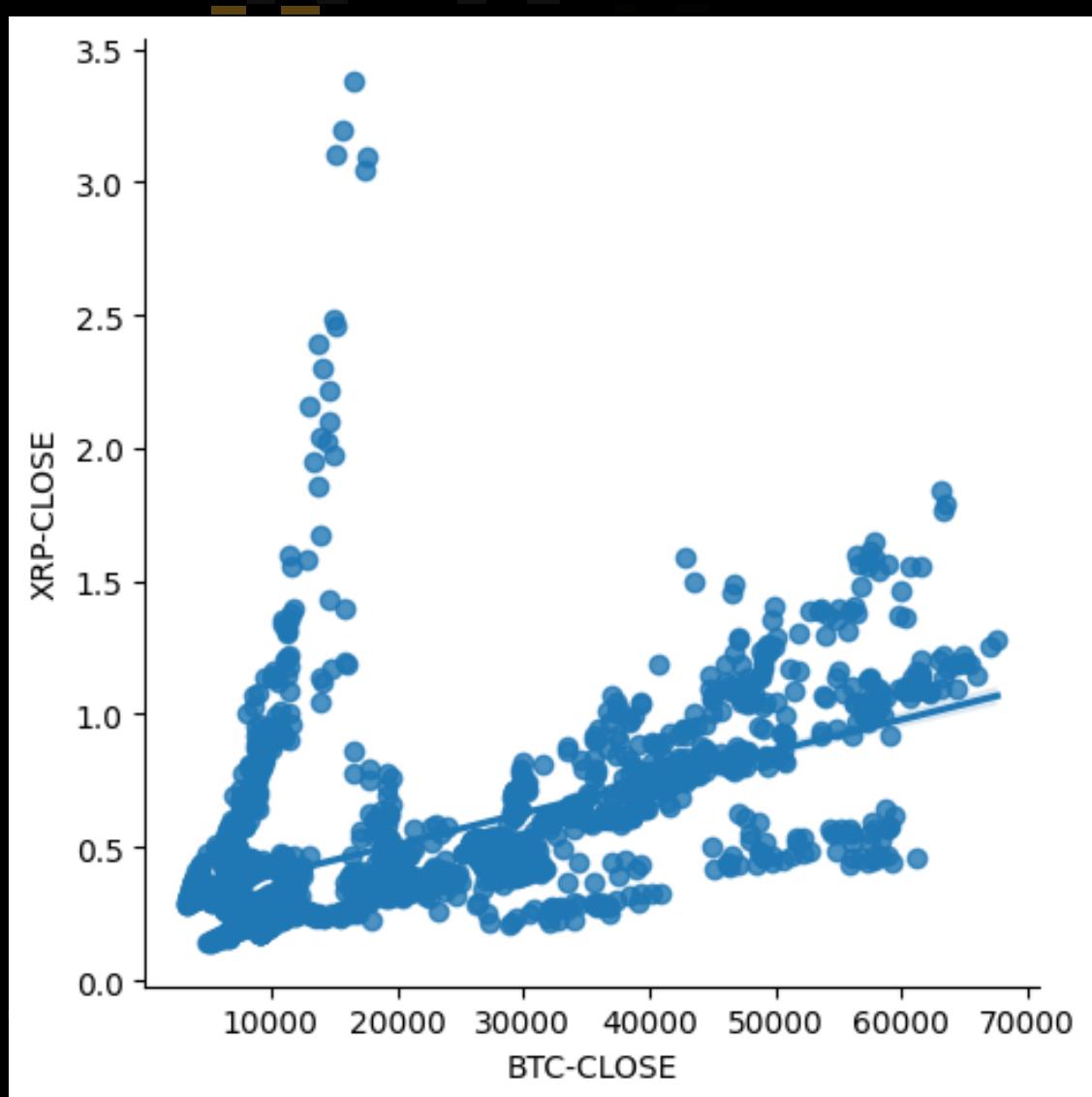


# PRICE CORRELATION



## INFLUENCE OF BTC ON ETH

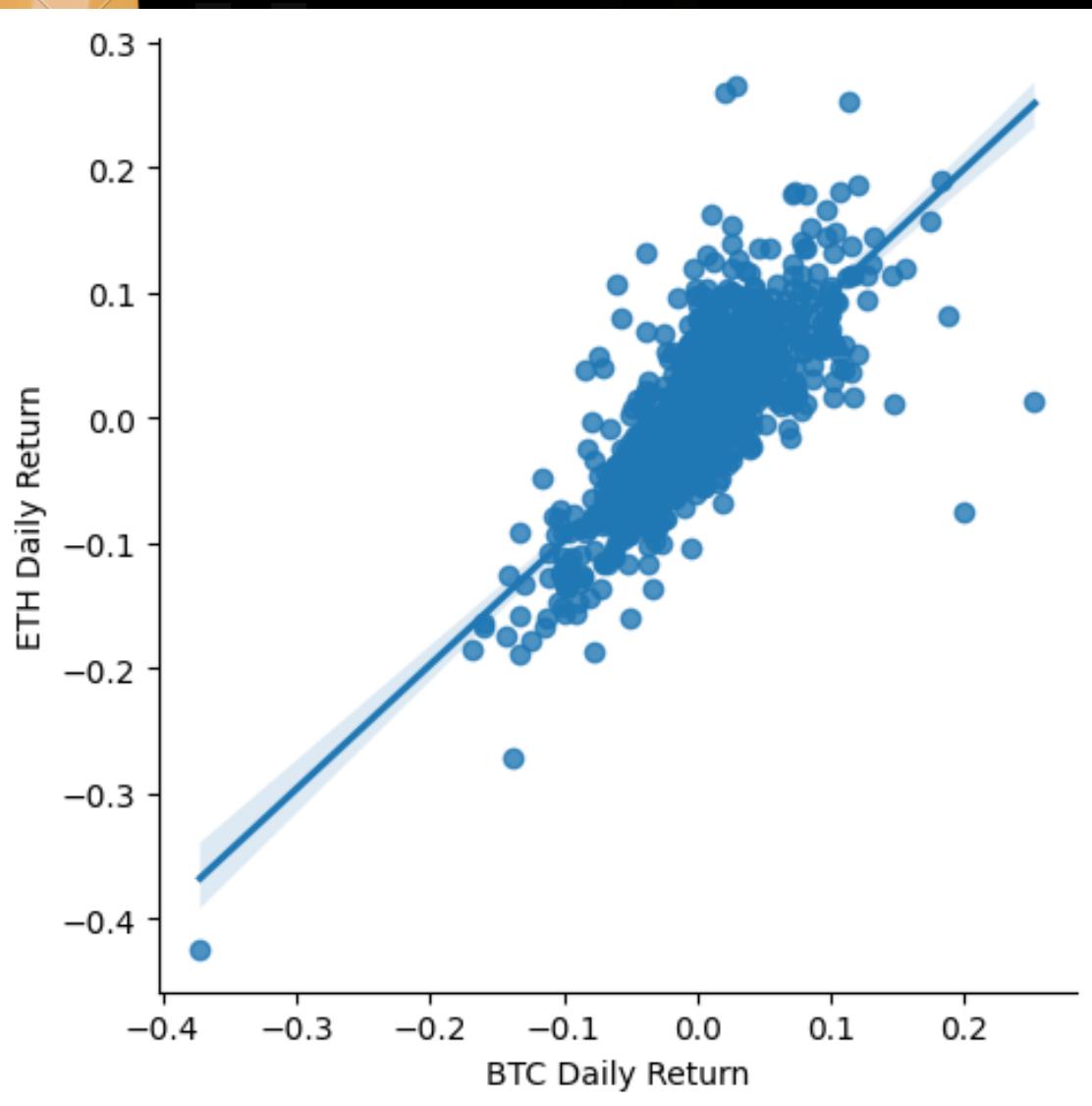
A 92% CORRELATION WAS FOUND BETWEEN THE CLOSING PRICE OF BITCOIN AND THE CLOSING PRICE OF ETHEREUM FROM DECEMBER 1, 2017, UNTIL NOW, INDICATING A STRONG RELATIONSHIP BETWEEN THE PRICE MOVEMENTS OF BOTH CRYPTOCURRENCIES. THIS MEANS THAT IF BITCOIN EXPERIENCES A PRICE INCREASE, THERE IS A HIGH LIKELIHOOD THAT ETHEREUM WILL ALSO SEE A PRICE INCREASE IN MOST CASES. SIMILARLY, IF BITCOIN EXPERIENCES A PRICE DECREASE, ETHEREUM TENDS TO FOLLOW A SIMILAR PATTERN.



## INFLUENCE OF BTC ON XRP

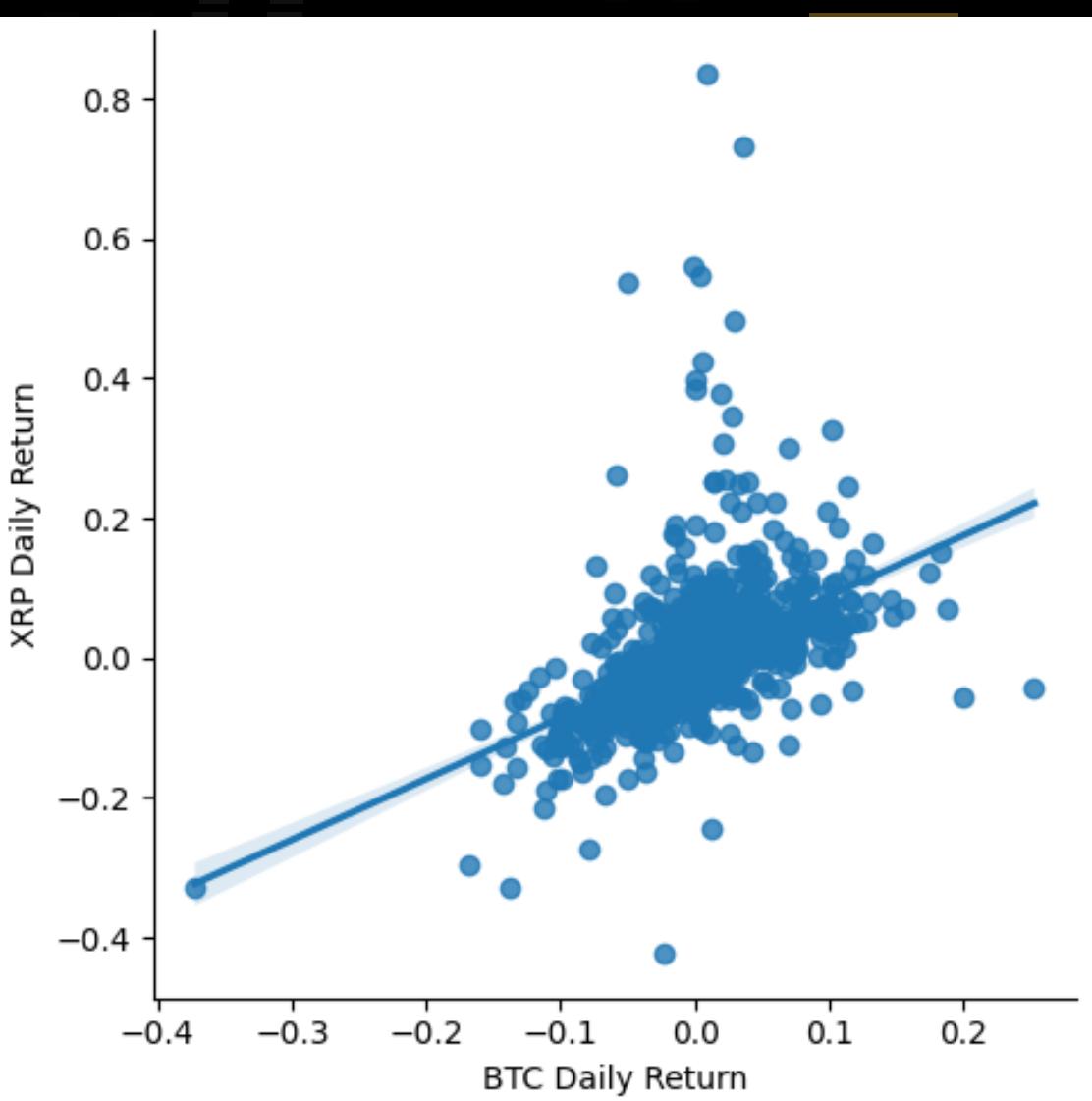
A 54% CORRELATION BETWEEN THE CLOSING PRICE OF BITCOIN AND THE CLOSING PRICE OF XRP FROM DECEMBER 1, 2017, UNTIL NOW INDICATES A LOWER OR MODERATE RELATIONSHIP BETWEEN THE PRICE MOVEMENTS OF THESE TWO CRYPTOCURRENCIES. THIS MEANS THAT WHEN THE PRICE OF BITCOIN RISES OR FALLS, THERE IS ABOUT A 54% CHANCE THAT THE PRICE OF XRP WILL FOLLOW A SIMILAR PATTERN IN SOME CASES. HOWEVER, THIS RELATIONSHIP IS NOT AS STRONG AS HIGHER CORRELATIONS AND CAN BE MORE VARIABLE.

# DAILY RETURN CORRELATION



## INFLUENCE OF BTC ON ETH

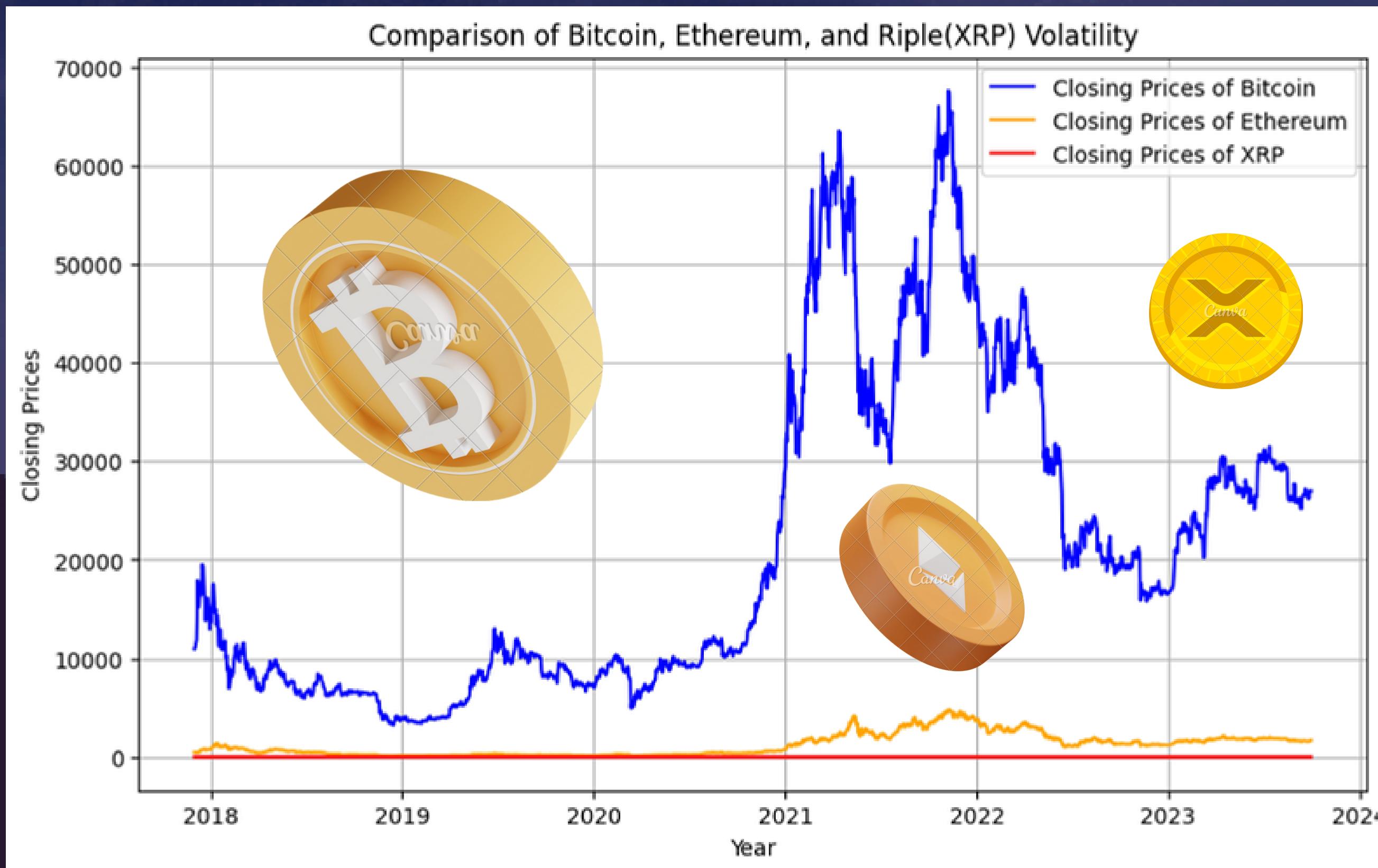
A 78% CORRELATION BETWEEN THE DAILY RETURNS OF BITCOIN (BTC) AND ETHEREUM (ETH) FROM DECEMBER 1, 2017, UNTIL NOW INDICATES A FAIRLY STRONG POSITIVE RELATIONSHIP BETWEEN THE DAILY PRICE CHANGES OF THESE TWO CRYPTOCURRENCIES. THIS MEANS THAT WHEN THE DAILY PRICE OF BITCOIN EXPERIENCES CHANGES (EITHER AN INCREASE OR A DECREASE), THERE IS ABOUT A 78% TENDENCY THAT THE PRICE OF ETHEREUM WILL ALSO EXPERIENCE SIMILAR DAILY CHANGES IN THE SAME DIRECTION. THIS DEMONSTRATES A POSITIVE CORRELATION BETWEEN THE DAILY MOVEMENTS OF THE TWO ASSETS, MEANING THAT THE DAILY MOVEMENTS OF ONE ASSET TEND TO BE FOLLOWED BY SIMILAR DAILY MOVEMENTS IN THE OTHER ASSET IN MOST CASES.



## INFLUENCE OF BTC ON XRP

A 51% CORRELATION BETWEEN THE DAILY RETURNS OF BITCOIN (BTC) AND THE DAILY RETURNS OF RIPLE (XRP) INDICATES A MODERATE POSITIVE RELATIONSHIP BETWEEN THE DAILY PRICE CHANGES OF THESE TWO CRYPTOCURRENCIES FROM DECEMBER 1, 2017, UNTIL NOW. THIS MEANS THAT WHEN THE DAILY PRICE OF BITCOIN EXPERIENCES CHANGES (EITHER AN INCREASE OR A DECREASE), THERE IS ABOUT A 51% TENDENCY THAT THE PRICE OF XRP WILL ALSO EXPERIENCE SIMILAR DAILY CHANGES IN THE SAME DIRECTION. THIS INDICATES A MODERATE LEVEL OF POSITIVE CORRELATION BETWEEN THE DAILY MOVEMENTS OF THE TWO ASSETS, MEANING THAT THE DAILY MOVEMENTS OF ONE ASSET TEND TO BE FOLLOWED BY SIMILAR DAILY MOVEMENTS IN THE OTHER ASSET TO A MODERATE DEGREE.

# VOLATILITY COMPARISON



The volatility of Bitcoin at 15916.23 indicates that Bitcoin prices tend to experience significant fluctuations over the course of six years. This means that investing in Bitcoin can involve high risk, with the potential for significant gains but also large losses in a short period.

On the other hand, Ethereum's volatility at 1132.38 shows lower price fluctuations compared to Bitcoin but still significant. Ethereum has lower volatility compared to Bitcoin, making it a relatively more stable asset from a volatility perspective.

The very low volatility of XRP at 0.3431 indicates that XRP prices have been very stable over six years. This could be a consideration for investors seeking a relatively stable asset, although in this case, the potential for significant gains may also be limited.

# OLS REGRESSION [BTC-ETH]

OLS Regression Results	
R-squared	0.872
Constant	-206.8359
F-statistic	1.368e+04
Durbin-Watson	0.018
Jarque-Bera	6251.310
BTC-CLOSE(coef)	0.0683

- R-squared value of 0.872 indicates that 87.2% of Ethereum price variability is explained by Bitcoin price movements, showing a strong relationship.
- Coefficients include a constant (-206.8359) and BTC-CLOSE coefficient (0.0683). The constant represents Ethereum prices when Bitcoin prices are zero, and the BTC-CLOSE coefficient shows how Bitcoin price changes affect Ethereum prices, with a positive coefficient indicating a price increase correlation.
- The F-statistic tests the overall significance of the regression model, with a high value (1.368e+04) and very low probability (Prob (F-statistic) = 0.00), indicating high statistical significance.
- The Durbin-Watson statistic measures autocorrelation in residuals, with a very low value (0.018) suggesting significant autocorrelation and potential deviation from linear regression assumptions.
- The Jarque-Bera (JB) test checks the normality of residuals, showing a high JB result (6251.310), a negative skew (-2.011), and high kurtosis (10.639), indicating non-normal distribution and potential skewness and heavy tails in residuals.



# OLS REGRESSION [BTC-XRP]

OLS Regression Results	
R-squared	0.297
Constant	0.2754
F-statistic	6.58e-165
Durbin-Watson	0.031
Jarque-Bera	62732.109
BTC-CLOSE(coef)	1.174e-05

- R-squared value of 0.297 implies that about 29.7% of XRP price variability can be attributed to Bitcoin price movements, indicating a relatively weak relationship between Bitcoin and XRP prices in this model. Most of XRP's price variability is independent of Bitcoin.
- Coefficients include a constant (0.2754) and the BTC-CLOSE coefficient (1.174e-05). The constant represents XRP prices when Bitcoin prices are zero, and the BTC-CLOSE coefficient signifies the minimal impact of Bitcoin price changes on XRP prices in this model.
- A high F-statistic (898.0) and very low probability (6.58e-165) indicate strong statistical significance for the entire regression model, suggesting there is a significant influence of Bitcoin prices on XRP prices.
- The very low Durbin-Watson statistic (0.031) indicates substantial autocorrelation in the model's residuals, suggesting the model may not meet linear regression assumptions.
- The high Jarque-Bera (JB) result (62732.109), positive skew (3.820), and high kurtosis (28.465) suggest that the residuals do not follow a normal distribution, indicating a deviation from the assumption of residual normality.



# CONCLUSION

## BTC - ETH

There is a significant relationship between Bitcoin and Ethereum prices, with Bitcoin having a strong positive influence on Ethereum prices. However, this model may not satisfy some crucial linear regression assumptions, such as residual normality, necessitating further analysis to ensure its fit with the data.

## BTC - XRP

- There is a low influence of Bitcoin prices on XRP prices. Most of the variability in XRP prices cannot be explained by Bitcoin prices in this model. Nevertheless, similar to the first model, this model also raises concerns regarding linear regression assumptions, such as residual normality and autocorrelation.

The results of both models indicate complexity in the relationship between cryptocurrencies, with some stronger aspects in the relationship between Bitcoin and Ethereum, while the relationship between Bitcoin and XRP appears weaker. However, in both cases, further analysis is crucial to gain a better understanding of the factors influencing cryptocurrency price movements and to validate the model's fit with the data.

# ADVICE

IT'S IMPORTANT TO REMEMBER THAT CORRELATION DOESN'T ALWAYS INDICATE CAUSATION. CORRELATION MERELY REFLECTS A STATISTICAL RELATIONSHIP BETWEEN BTC-ETH-XRP AND CANNOT BE USED TO PREDICT FUTURE PRICE MOVEMENTS WITH CERTAINTY. ADDITIONALLY, CRYPTOCURRENCIES ARE HIGHLY SUSCEPTIBLE TO HIGH VOLATILITY, AND OTHER FACTORS LIKE NEWS, TECHNOLOGICAL DEVELOPMENTS, REGULATIONS, AND MARKET SENTIMENT CAN ALSO INFLUENCE CRYPTO PRICE MOVEMENTS.