

Media and Bitcoin

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Motivation

Large percentage of the first world population invests

One of the best performing investments

No easily derivable trend

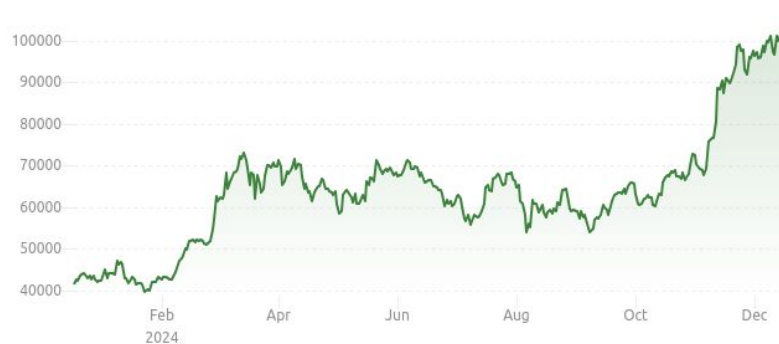
Said the price is based on hype

Better informed investment

103,780.00 USD **+64,794.39** **(+156.47%)** ↑

Monday, 1:29 PM GMT+1 • Disclaimer

1 Day 5 Days 1 Month **1 Year** 5 Years Max



Data

Crypto News +

- Amount of weekly entries
- Sentiment data

Bitcoin Daily

- Opening price
- Traded volume

Period: 2022/01/01 - 2023/12/19



Research questions

Does the amount of media attention affect the bitcoin price or vice versa?

Does the amount of media attention affect the trading volume of bitcoin or vice versa?

Does the sentiment of the media affect the bitcoin price or vice versa?

Does the sentiment of the media affect the trading volume of bitcoin or vice versa?

Hypothesis

We assume that for all research question

H0: The first variable **does not** affect the second variable

H1: The first variable **does** affect the second variable

Value and assumptions

Does give look at the relation between media and bitcoin

Does not predict the future bitcoin price

We assume that our sample is not an outlier in terms of bitcoin vs media data

Implementation

Preparing the Data

Vector AutoRegression

Granger causality

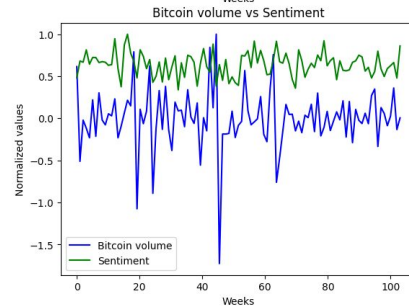
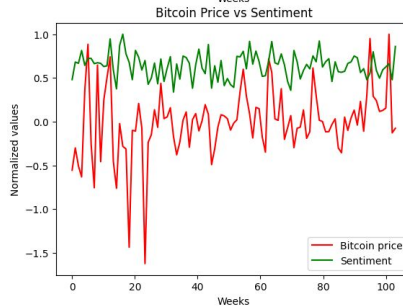
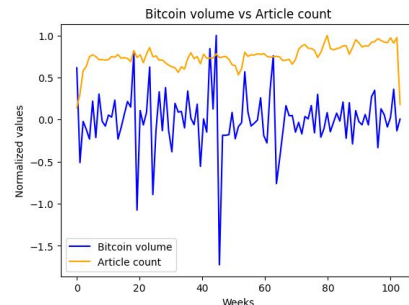
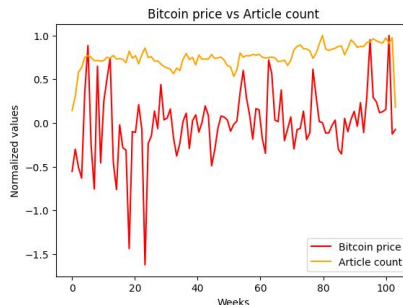
Preparing the Data

Stationary data

Augmented Dickey-Fuller

- Tests if data is stationary

```
Bitcoin price is stationary | p-value: 4.4567176804253537e-13  
Bitcoin volume is stationary | p-value: 6.038046780346206e-13  
Article count is stationary | p-value: 4.5240581131031196e-05  
News polarity is stationary | p-value: 1.3517752025053774e-29
```



Vector AutoRegression (VAR)

Analysing and forecasting multivariate time series data

Modeled using lags

Potentially endogenous

Akaike Information Criterion (AIC)

- Used to compare statistical models
- Penalises high parameter amounts

Results for equation count				
	coefficient	std. error	t-stat	prob
const	83.933278	35.193939	2.385	0.017
L1.count	0.675089	0.174936	3.859	0.000
L1.open_diff	0.004472	0.002034	2.199	0.028
L2.count	0.045432	0.227468	0.200	0.842
L2.open_diff	-0.004799	0.002118	-2.266	0.023
L3.count	-0.147777	0.222056	-0.665	0.506
L3.open_diff	0.001489	0.002200	0.677	0.498
L4.count	0.118687	0.217731	0.545	0.586
L4.open_diff	-0.001808	0.002175	-0.832	0.406
L5.count	0.027941	0.146166	0.191	0.848
L5.open_diff	0.000505	0.002095	0.241	0.810

$$C_t = 0.675 \cdot C_{t-1} + 0.004 \cdot O_{t-1} - 0.004 \cdot O_{t-2}$$

Granger Causality

Directly states if variable X has an effect on variable Y

Determines Granger Causality

```
----- count on open_diff -----
```

```
Granger Causality
number of lags (no zero) 2
ssr based F test:      F=4.2260 , p=0.0174 , df_denom=96, df_num=2
ssr based chi2 test:   chi2=8.8922 , p=0.0117 , df=2
likelihood ratio test: chi2=8.5224 , p=0.0141 , df=2
parameter F test:      F=4.2260 , p=0.0174 , df_denom=96, df_num=2
+ count Granger Causes open_diff
```

```
----- open_diff on count -----
```

```
Granger Causality
number of lags (no zero) 15
ssr based F test:      F=1.2328 , p=0.2756 , df_denom=57, df_num=15
ssr based chi2 test:   chi2=28.5489 , p=0.0184 , df=15
likelihood ratio test: chi2=24.7257 , p=0.0538 , df=15
parameter F test:      F=1.2328 , p=0.2756 , df_denom=57, df_num=15
- open_diff does not Granger Cause count
```

Results

Amount of news Granger causes bitcoin opening price

News polarity Granger causes bitcoin opening price

News polarity Granger causes traded bitcoin volume

```
+ count Granger Causes open_diff
- open_diff does not Granger Cause count
- count does not Granger Cause volume_diff
- volume_diff does not Granger Cause count
+ polarity_mean Granger Causes open_diff
- open_diff does not Granger Cause polarity_mean
+ polarity_mean Granger Causes volume_diff
- volume_diff does not Granger Cause polarity_mean
```

Conclusion

News does significantly affect bitcoin

Bitcoin does not significantly affect news