Study case 2024

Analyzing Bitcoin Price Trends Using Crypto News (2021-2023)

Exploring the correlation between sentiment, significance and market trends.

Francescut R., 20 November 2024 - CodeOp

What is Bitcoin???

Miners use computational power to validate and record transactions on the Bitcoin blockchain.

As a reward for their work, they receive a certain amount of newly created Bitcoin.
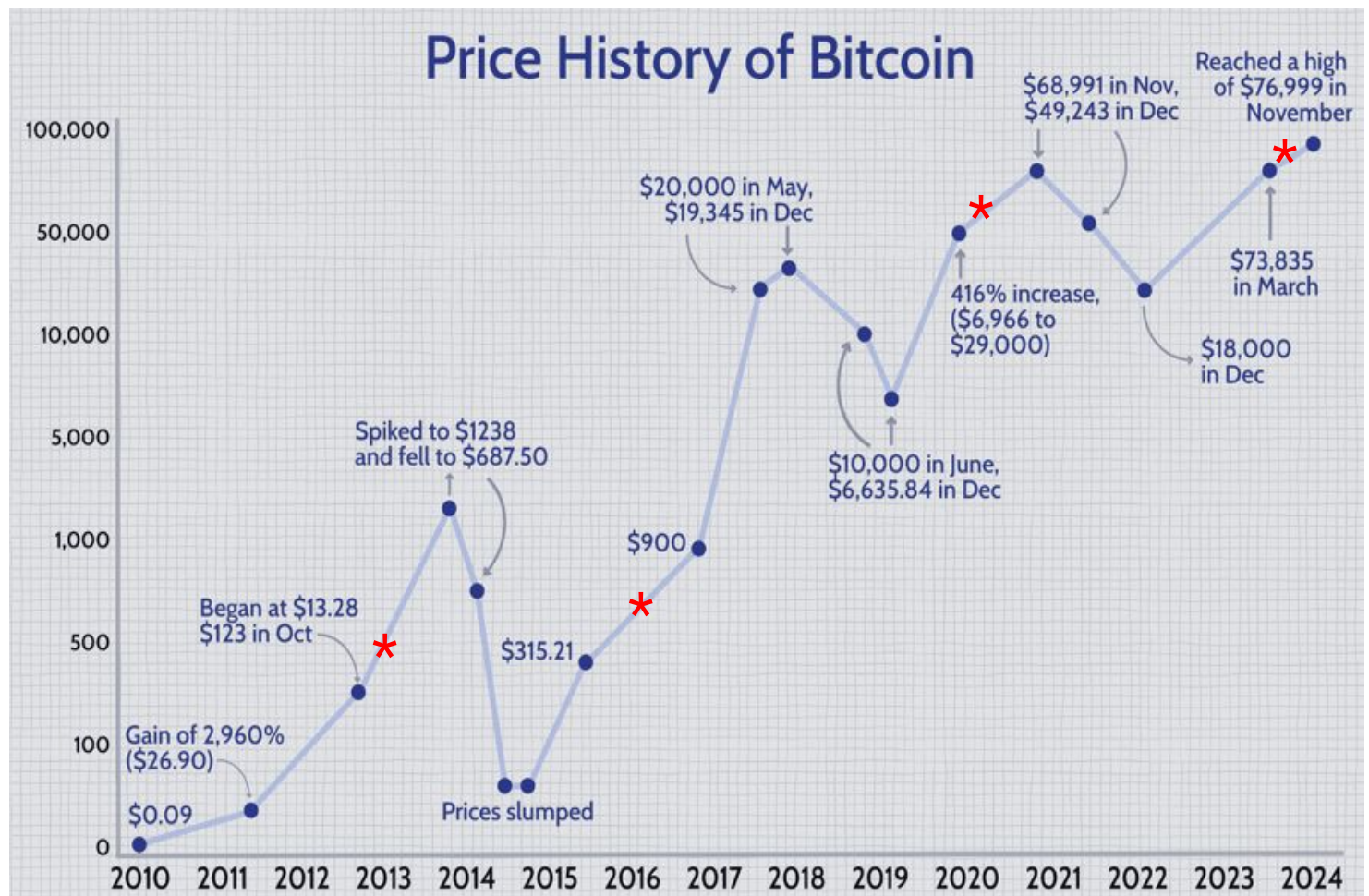
Bitcoin (BTC)

[bit-,köin]

A cryptocurrency, a virtual currency designed to act as money and a form of payment outside the control of any one person, group, or entity, and thus removing the need for third-party involvement in financial transactions.

The "halving" is a pre-programmed event that reduces the mining reward by half approximately every four years.

- 3 January 2009

- 28 Novmbr 2012

- 9 July 2016

- 11 May 2020

- 19 April 2024

At the moment the rewards stand at 3,125BTC for successful miners.

Price History of Bitcoin

$68,991 in Nov,
$49,243 in Dec

Reached a high of $76,999 in November

$20,000 in May,
$19,345 in Dec

*

416% increase,
($6,966 to
$29,000)

$73,835
in March

$10,000 in June,
$6,635.84 in Dec

$18,000
in Dec

Spiked to $1238
and fell to $687.50

$900

Began at $13.28
$123 in Oct

*

$315.21

*

Gain of 2,960%
($26.90)

$0.09

Prices slumped

100,000

50,000

10,000

5,000

1,000

500

100

0

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024

However, my problem statement:

Bitcoin prices are highly volatile and influenced by multiple factors, including news and market sentiment.

Objective

Dataset Scope

Problem Statement

Investigate how crypto news sentiment and significance influence Bitcoin price trends.

Focus on predicting and understanding significant price changes using a combined dataset of crypto news and Bitcoin price data.

Crypto News:
Over 3 years (2021-2023), with sentiment, user-defined importance, and engagement metrics.

Bitcoin Prices:
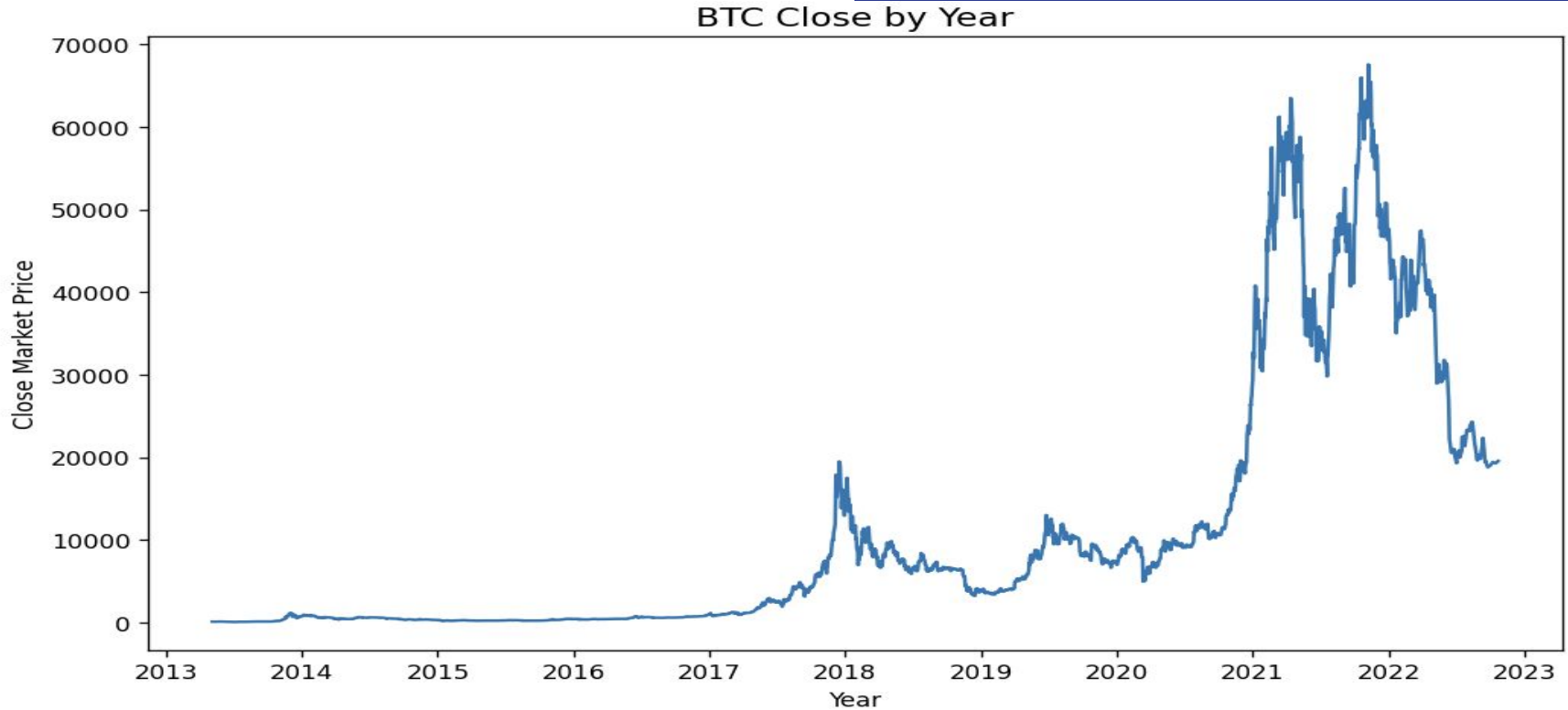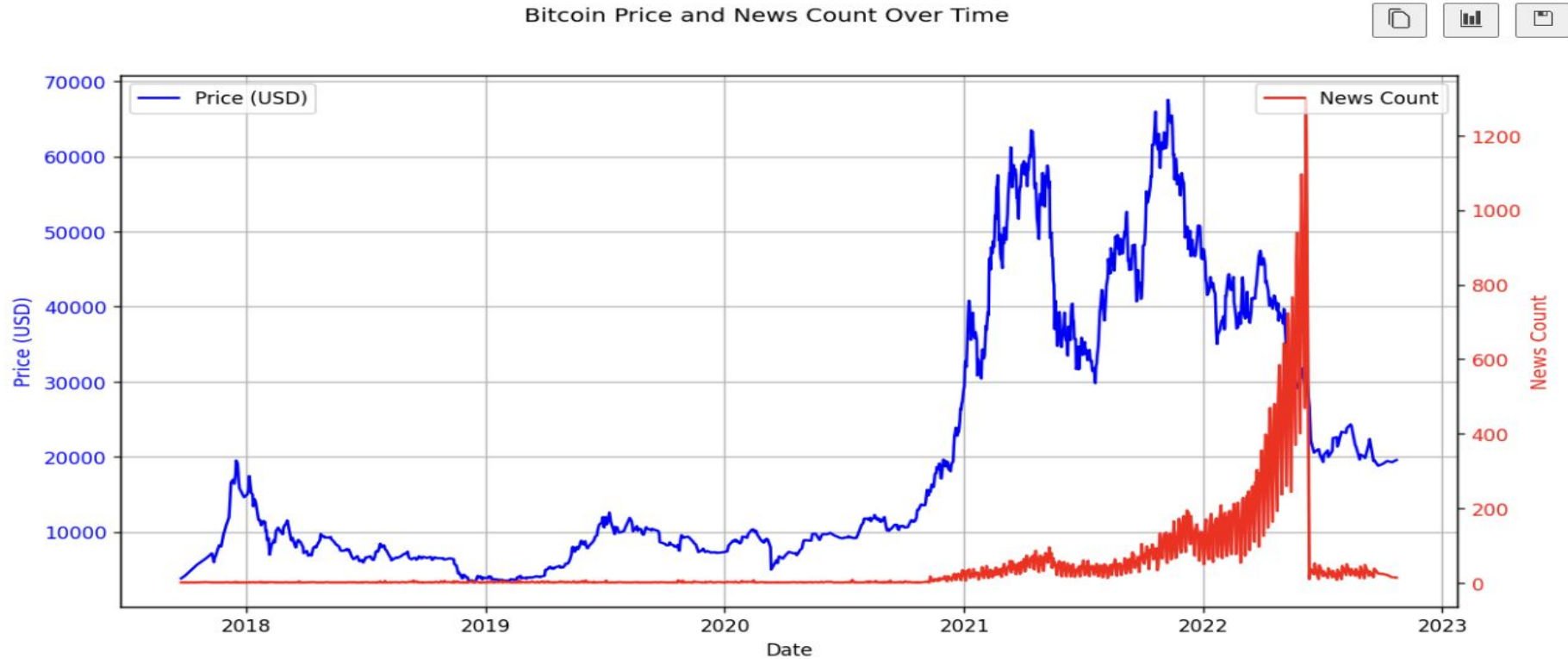3-day moving averages, closing prices, and volatility metrics.

Can we identify patterns in crypto news that predict or correlate with significant Bitcoin price changes?

What are the most frequent keywords in news articles linked to price shifts? changes?

Graph of the trend of the Bitcoin close by Year

BTC Close by Year

Graph of the trend of the Bitcoin close by Year VS. The Count of the News per each day

Bitcoin Price and News Count Over Time

dataset with significative price change

significant_changes

✓ 0.0s

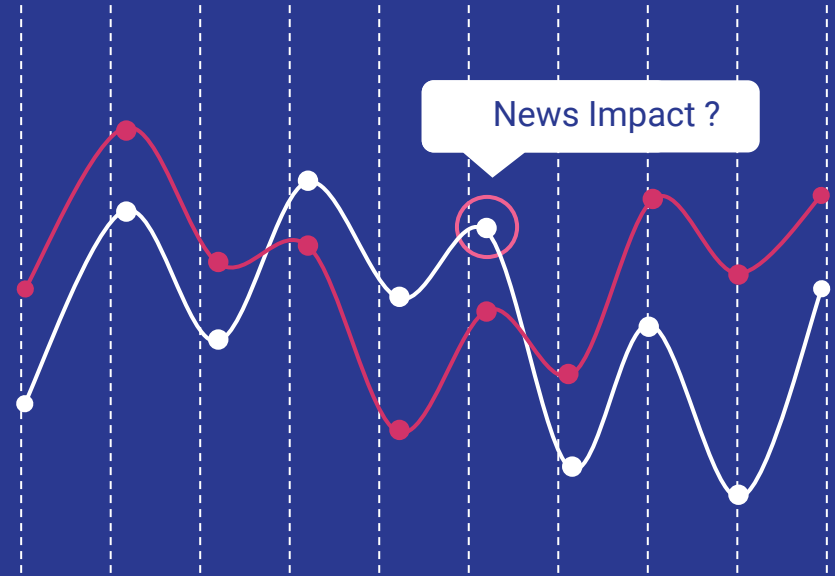| date	Unnamed: 0	open	high	low	close	volume	marketCap	timestamp	crypto_name	vol_year	3_day_MA	price_change
2013-05-07	4	112.250000	113.444000	97.699997	111.500000	0.000000e+00	1.240594e+09	2013-05-07T23:59:59.999Z	Bitcoin	0.402164	113.236669	-0.007124
2013-05-08	7	109.599998	115.779999	109.599998	113.566002	0.000000e+00	1.264049e+09	2013-05-08T23:59:59.999Z	Bitcoin	0.409615	112.455335	0.018529
2013-05-09	9	113.199997	113.459999	109.260002	112.669998	0.000000e+00	1.254535e+09	2013-05-09T23:59:59.999Z	Bitcoin	0.406384	112.578667	-0.007890
2013-05-10	10	112.799004	122.000000	111.551003	117.199997	0.000000e+00	1.305479e+09	2013-05-10T23:59:59.999Z	Bitcoin	0.422723	114.478666	0.040206
2013-05-11	12	117.699997	118.679001	113.010002	115.242996	0.000000e+00	1.284207e+09	2013-05-11T23:59:59.999Z	Bitcoin	0.415664	115.037664	-0.016698
...	...	...	...	...	...	...	...	...	...	...	...	...
2022-09-25	72692	18936.311515	19134.733194	18696.468304	18802.097976	2.335997e+10	3.602593e+11	2022-09-25T23:59:59.999Z	Bitcoin	2.032698	19255.244472	-0.037967
2022-10-02	72752	19311.848708	19370.309281	18970.620583	19044.107272	2.076596e+10	3.650248e+11	2022-10-02T23:59:59.999Z	Bitcoin	2.058862	19130.111499	0.012871
2022-10-09	72815	19417.479411	19542.538654	19349.258953	19446.426194	1.683726e+10	3.728768e+11	2022-10-09T23:59:59.999Z	Bitcoin	2.102357	19097.543814	0.021126
2022-10-16	72845	19068.913560	19389.603520	19068.913560	19268.092801	1.798892e+10	3.695843e+11	2022-10-16T23:59:59.999Z	Bitcoin	2.083077	19252.875422	-0.009170
2022-10-23	72912	19207.734651	19646.651542	19124.196965	19567.007398	2.212879e+10	3.754443e+11	2022-10-23T23:59:59.999Z	Bitcoin	2.115393	19427.175464	0.015513

3246 rows × 12 columns

Dataset with crypto news normalized

	id	title	sourceId	date	url	negative	positive	important	liked	disliked	lol	toxic	saved	comments	timestamp	date_normal
0	873	ApeCoin Community Votes to Stay on Ethereum	2	6/9/2022 6:57	https://cryptopanic.com/news/15444990/ApeCoin-...	0	0	0	0	0	0	0	0	0	2022-06-09 06:57:00	2022-06-09
1	875	Terraform Labs Co-Founder Denies Accusations o...	2	6/9/2022 6:03	https://cryptopanic.com/news/15443520/Terrafor...	0	0	0	1	0	0	0	0	0	2022-06-09 06:03:00	2022-06-09
2	876	Anchor dev claims he warned Do Kwon over unsus...	7	6/9/2022 5:39	https://cryptopanic.com/news/15442676/Anchor-d...	1	0	1	0	0	0	0	0	0	2022-06-09 05:39:00	2022-06-09
3	877	With 12 Key Measures of Prices, Truflation's R...	11	6/9/2022 5:32	https://cryptopanic.com/news/15442724/With-12-...	0	0	0	0	0	0	0	0	0	2022-06-09 05:32:00	2022-06-09
4	878	'Father' of the Metaverse Neal Stephenson laun...	7	6/9/2022 5:28	https://cryptopanic.com/news/15442350/Father-o...	0	1	0	2	0	0	0	0	0	2022-06-09 05:28:00	2022-06-09
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
164996	174621	ETH-based Memecoin, MOG Hits New ATH, Enters T...	144	7/15/2024 13:15	https://cryptopanic.com/news/19688034/ETH-base...	0	0	0	0	0	0	0	0	0	2024-07-15 13:15:00	2024-07-15
164997	174622	Mog Coin Price Continues to Surge as New Wiene...	144	7/15/2024 11:24	https://cryptopanic.com/news/19687607/Mog-Coin...	0	0	0	0	0	0	0	0	0	2024-07-15 11:24:00	2024-07-15
164998	174623	Ethereum Memecoin MOG Becomes Biggest 24H Gain...	134	7/15/2024 7:02	https://cryptopanic.com/news/19687017/Ethereum...	0	0	0	0	0	0	0	0	0	2024-07-15 07:02:00	2024-07-15
164999	174624	Year-to-Date Crypto Winners: Meme Coins Outper...	24	7/13/2024 14:20	https://cryptopanic.com/news/19683727/Year-to-...	0	0	0	0	0	0	0	0	0	2024-07-13 14:20:00	2024-07-13
165000	174625	Solana (SOL) Tanks Nearly 6% Despite Meme Coin...	127	7/12/2024 14:53	https://cryptopanic.com/news/19681227/Solana-S...	0	0	0	0	0	0	0	0	0	2024-07-12 14:53:00	2024-07-12

News Impact

I aim to investigate two key correlations in my research:

- The relationship between specific words used in cryptocurrency news and subsequent Bitcoin price changes
- The correlation between news sentiment (as defined by users) and the perceived importance of those news events
- Analyze the news which are common when there is a drastic price change.

To be continued...