

# BTC vs Gold Performance during COVID-19 Pandemic Window (Jan 2020 - Dec 2023)

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# Mengapa Analisis Ini?

## Background

Bermula dari rasa penasaran karena ATH (*All Time High*) baru Bitcoin (BTC) di pertengahan Juli 2025 kemarin, saya mencoba menganalisis lebih dalam performa aset tersebut terutama saat adanya tekanan seperti krisis global.

Misalnya salah satu fenomena ***black swan***, yaitu Pandemi COVID-19 yang berlangsung dari 2020 - 2023.

Aku ingin eksplor membandingkan performa emas yang disebut sebagai *safe haven* terhadap Bitcoin dengan pendekatan data analitik.

## What to expect from this analysis?

1. Gambaran performa dan volatilitas bitcoin dan emas dalam tekanan krisis COVID-19.
2. Volatilitas tersebut menjadi pertimbangan sesuai profil risiko pembeli.
3. Workflow dimulai dari raw data asset sampai visualisasi cukup teknis, but I will do my best to **highlight the findings and insights** in best general way possible.

### Tools I used & workflow:

Raw dataset (.csv) > SQL (PostgreSQL) > Railway (cloud host)  
> Google Sheet with Coefficient extension (integration to database PostgreSQL) > Tableau Public (data viz)

# Key Findings & Insights #1

## Insight #1: Return Profit

Selama periode Jan 2020 – Des 2023, pada titik All Time High (ATH) masing-masing asset:

- BTC tumbuh ~900%
- Emas tumbuh ~136%
- Meskipun emas lebih konservatif, tetap memberi perlindungan nilai. Kamu akan tetap mendapatkan profit ~1,3 kali lipat jika kamu mulai invest sejak dari awal Jan 2020
- BTC memberikan profit ~9 kali lipat terhitung sejak awal Jan 2020, namun risikonya juga besar.

### Contoh ekstrim:

Pada 12 Maret 2020, harga BTC tiba-tiba turun 39,5% (dari \$7.935 ke \$4.800) hanya dalam sehari.

Misalnya, kamu baru beli BTC di 11 Maret 2020, nilai assetmu bisa langsung terpangkas hampir setengahnya keesokan harinya.

### High Return = High Risk.

**Volatilitas yang tinggi adalah harga yang harus dibayar untuk potensi profit yang juga tinggi**

BTC vs Gold Normalize Close Price during COVID-19 Pandemic Window (Jan 2020 - Dec 2023)



#### Key insights:

1. BTC delivered a +938% return from its baseline on 01 Jan 2020, meaning turning every \$1 into over \$9 at its peak on 08 Nov 2021. Meanwhile, Gold returned approximately +36%, reaching 1.36x growth from its baseline
2. BTC's superior performance comes with high volatility risk. A prime example is the bitcoin crash on 12 March 2020, where BTC dropped 39.5% within a single day (from 7.935 to 4.800).
3. In comparison, Gold's sharpest one-day loss was only -5.67%, emphasizing gold's relative stability during global uncertainty.

These contrasting behaviors highlight the **risk-return tradeoff** between BTC and Gold. A deeper look into **volatility patterns** further reveals how consistently volatile each asset is.

View on Tableau Public

# Key Findings & Insights #2

## Insight #2: The Volatility

Di grafik pertama, Relative Volatility atau Coefficient of Variation (CV), BTC secara konsisten lebih *noisy*, fluktuasi harian yang besar dan frekuensi *spike* yang lebih sering (*high swings and spikes in every moves*). Artinya harga BTC jauh lebih sering menyimpang dari rata-ratanya dibandingkan dengan emas.

However.....

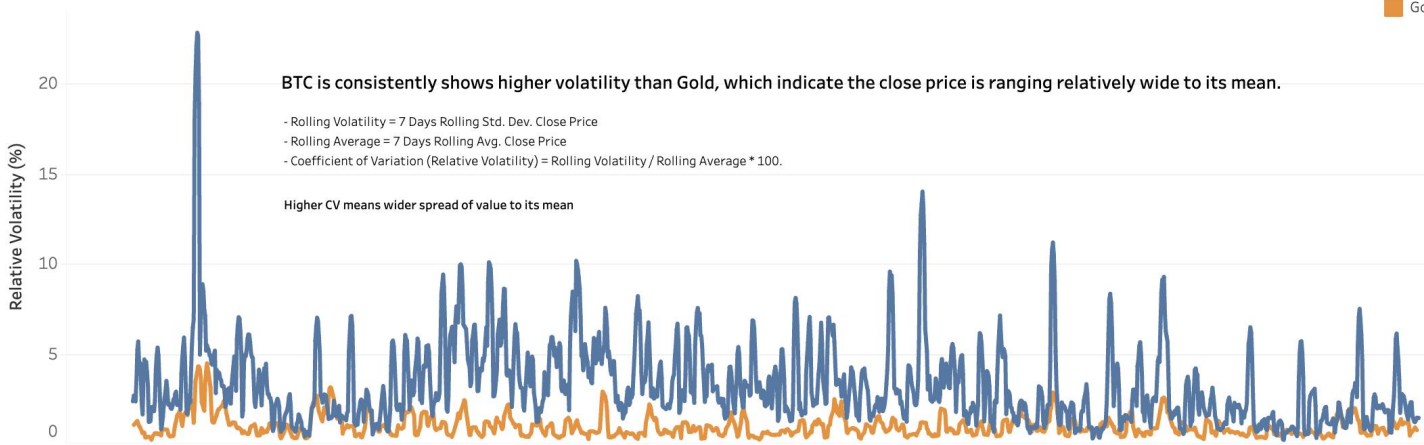
Emas yang biasanya tenang justru menunjukkan lonjakan z-score selama periode krisis (grafik kedua). Fenonema ekstrim seperti pandemi Covid-19 juga mengejutkan asset yang relatif stabil, seperti emas.

Meskipun emas *less volatile*, dalam tekanan krisis emas lebih reaktif relatif terhadap riwayat harganya. Sementara BTC, by its nature, already high volatility & high risk. The crisis shocks just additional noise to it.

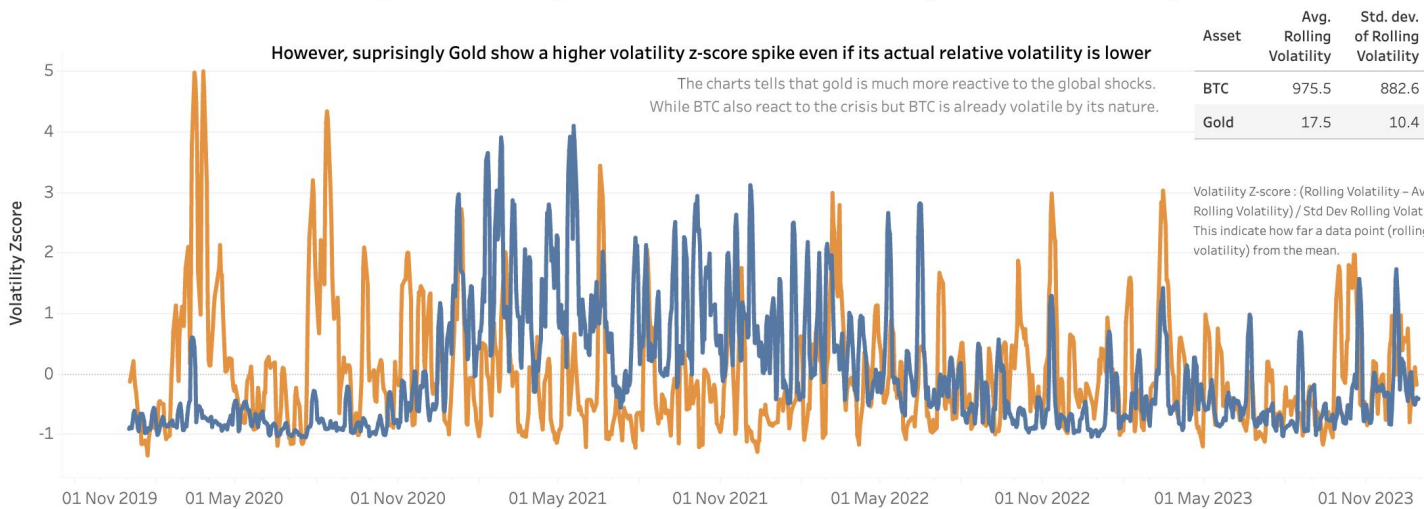
Sebagaimana disebutkan oleh Yarovaya et al. (2022), Covid-19 sebagai peristiwa “*black swan*” memengaruhi berbagai jenis aset secara bersamaan, tidak terbatas pada aset berisiko tinggi seperti kripto ataupun yang *less risky* seperti emas.

Sumber: Yarovaya et al. (2022)  
[doi.org/10.1016/j.ribaf.2021.101521](https://doi.org/10.1016/j.ribaf.2021.101521)

BTC vs Gold Relative Volatility during COVID-19 Pandemic Window (Jan 2020 - Dec 2023)



BTC vs Gold Close Price Volatility ZScore during COVID-19 Pandemic Window (Jan 2020 - Dec 2023)



Volatility Z-score Value Categorization: Low Volatility <= -0.5; Mid Volatility 0.5 - 0.5 ; High Volatility >= 0.5

[View on Tableau Public](#)

# Key Findings & Insights #3

## Insight #3: Momentum & Trend

### Momentum

- 89% hari pada BTC dan 88% hari pada emas berada di zona “Sideways/Mild (Bullish or Bearish)” dari seluruh pergerakan harga harian sejak 2020 - 2023).
- Hari ekstrim (Strong Bullish & Strong Bearish) hanya ~10% (BTC) & ~12% (emas).

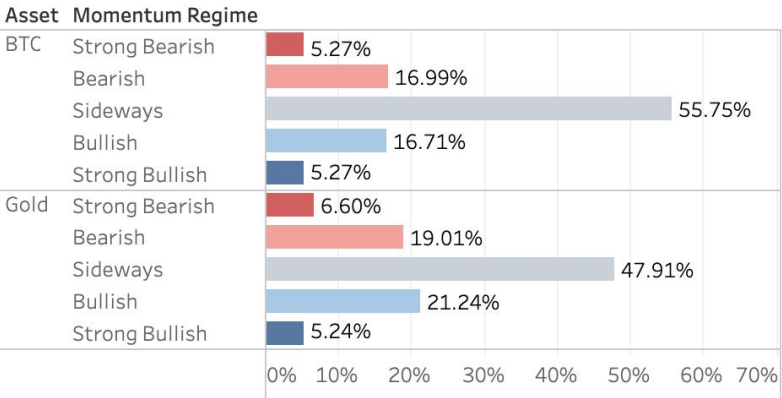
### Trend

- Close price kedua aset tersebut yang berada di atas moving average ~54% hari.
- Perbedaan yang signifikan adalah ketika *uptrend* (*above trend*) ataupun *downtrend* (*below trend*) BTC lebih eksplosif, sementara emas lebih stabil.

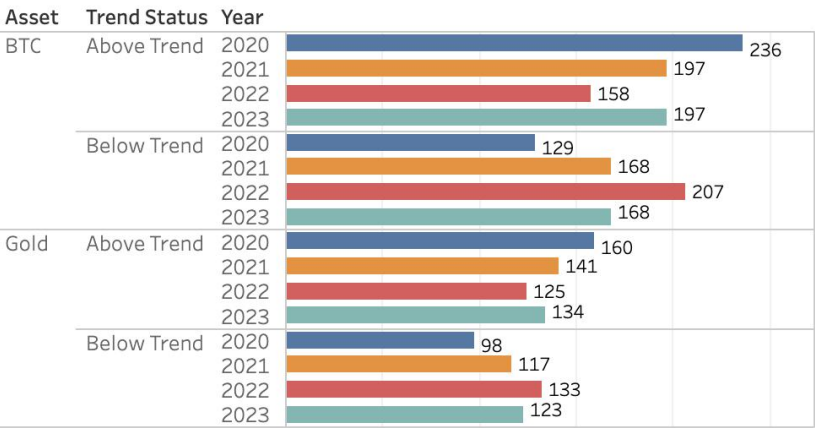
**Above trend :**  
7 days moving average > close price

**Below trend :**  
7 days moving average < close price

Momentum Regime categorized based daily percent change Z-Score Value  
Number of occurrence each category out of 2491 records  
BTC: 1460 records and Gold: 1031 records



Trend Status - close price and 7 days rolling average comparison  
Number of occurrence each category out of 2491 records  
BTC: 1460 records and Gold: 1031 records

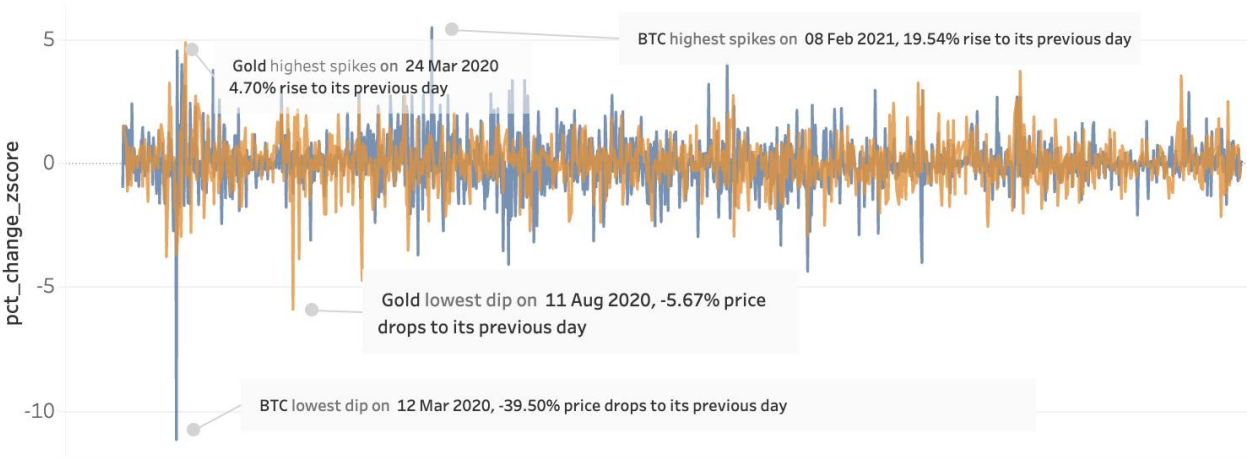


#### Key Insights:

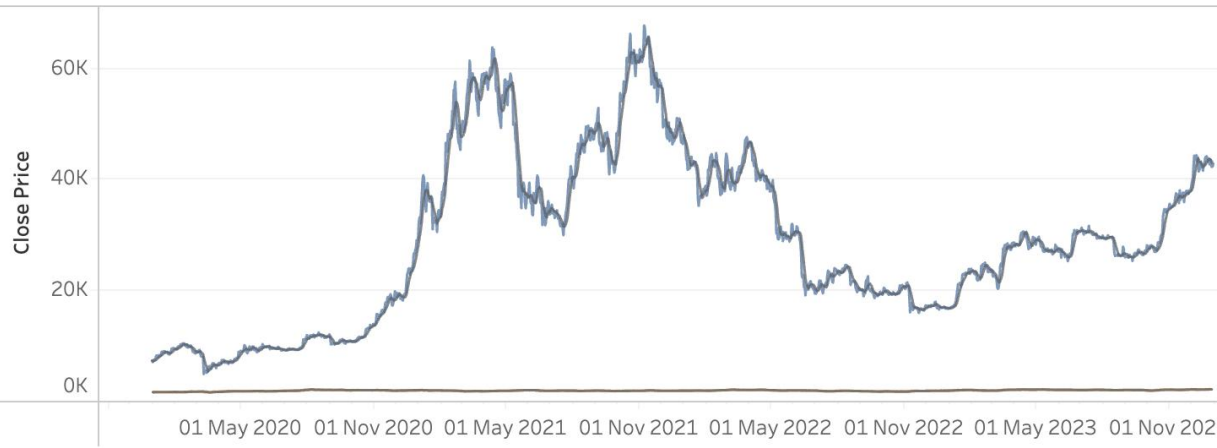
Both BTC and Gold spent most days sideways or mild (bullish or bearish) momentum regimes (~88% - 89% of total days), with estimated only ~10-12% of days show extreme moves (strong bullish or strong bearish). While BTC's daily percent change shows bigger volatility to Gold's, its higher noise floor means fewer days cross our 'strong' thresholds. Whereas Gold, which normally very stable, flags 'extreme' strong moves slightly more often. At the same time, each asset spent roughly 54% of days above its 7-day rolling average, The real divergence lies in BTC's capture explosive returns when "above trend" days but with high whipsaw risk. Whereas, gold's are steadier and less prone to false breakouts.

[View on Tableau Public](#)

BTC vs Gold daily percent change Z-score during COVID-19 Pandemic Window (Jan 2020 - Dec 2023)



Close Price & 7 Days Rolling Average during COVID-19 Pandemic Window (Jan 2020 - Dec 2023)





# Disclaimer

Analisis ini dibuat murni untuk tujuan sebagai bagian dari eksplorasi pribadi saya dalam teknik analisis data. Dari mulai proses ETL / ELT, eksplorasi data, *data wrangling*, SQL query, data visualisasi sampai generating insights.

Analisis ini bukan merupakan saran investasi, ajakan membeli, atau bentuk promosi terhadap Bitcoin, Emas, maupun aset keuangan lainnya. Selalu lakukan riset dan pertimbangan mandiri sebelum mengambil keputusan finansial.

# Thank you!

I hope you find this useful! 😊






Lihat data lengkap, kode dan visualisasi di GitHub:

<https://github.com/yudityaarth/BTC-vs-Gold-Performance-Analysis-during-COVID-19-Pandemic-Window/>

Interaktif dashboard di Tableau:

[https://public.tableau.com/views/BTCandGoldPerfomanceonCOVID-19PandemicWindow/Story?:language=en-US&publish=yes&:sid=&:redirect=auth&:display\\_count=n&:origin=viz\\_share\\_link](https://public.tableau.com/views/BTCandGoldPerfomanceonCOVID-19PandemicWindow/Story?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link)

Questions or Feedback? Please email ke [yuditya\\_artha@outlook.com](mailto:yuditya_artha@outlook.com) or DM me 😊

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