

BTC Metrics Notebook

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This notebook provides my actual understanding on how to calculate and understand Bitcoin network ratios using data freely available via [CoinMetrics](#). The ratio explored here are used as market timing indicators with the goal of identifying periods of over and under-valuation for BTC.

Column descriptions

The CoinMetrics community data dump provides several pre-calculated columns. We will use the following columns to derive all ratios.

Name	Description
CapMrktCurUSD:	The sum USD value of the current supply. Also referred to as network value or market capitalization.
CapRealUSD:	The sum USD value based on the USD closing price on the day that a native unit last moved (i.e., last transacted) for all native units.
TxTfrValAdjUSD:	The USD value of the sum of native units transferred between distinct addresses that interval removing noise and certain artifacts.
PriceUSD:	The fixed closing price of the asset as of 00:00 UTC the following day for end-of-day data or the closest prior hour for block-by-block data, denominated in USD.

Metrics descriptions

The study of on-chain fundamentals often focuses on measuring the intrinsic value of a cryptoasset using data derived directly from the blockchain. It differs from evaluating cryptoassets based on technical analysis (TA) or social sentiment, which attempt to measure an asset's value by identifying patterns and trends in market activity or media attention. Most of the ratios explored in this notebook are primarily used as market timing indicators with the goal of identifying periods of over and under-valuation for BTC. The following chart give the details of the description of the metrics in use and their calcuation.

BTC METRICS

Name	Description	Formula	On-chain metric	Assumption
Network Value to Transactions (NVT)	Modelled after the price-to-earnings (PE) ratio for valuing a traditional company.	Market capitalization (USD) / Total transaction volume (USD)	High values of the NVT ratio have reliably detected bubbles and low values have indicated attractive entry points in the past.	Uses transaction volume as a proxy for measuring the utility users are deriving from the blockchain
Market Value to Realized Value (MVRV)	amount of a coin's supply that is held in profit versus held at a loss, on average	Market capitalization / Realized value.	can get an idea of the average profitability of coin investors. If MV is higher than RV, this indicates on average investors are holding the coin at a profit.	Realized value evaluates and values each coin unit at the time it was last moved on-chain. assumong that on-chain movement is indicative of coins changing owners.

NVTRatioAdj	help reduce noise in our data series is a rolling average.	NVT with 7, 14, 28 and 70 day rolling averages.	This smooths out the time series	window sizes divisible by 7 so that any period contains full-week periods and smooths out day-of-the-week effects.
NVT Signal Ratio (NVTs)	Applying a rolling average to the transaction volume component in the denominator of the ratio	Market Cap (USD) $t1N * \sum_{n=tt-N}^n$ Daily On-Chain Transaction Volume (USD) n	Using the NVTsRatioRoll90 data series, we can calculate the 10th and 90th percentile values for NVTs,	Use these as thresholds to warn when this ratio is approaching extreme values.
Realized Cap to Transaction Ratio (RVT)	Version of NVT that uses Realized Cap from CoinMetrics in the numerator instead of Market Cap.	Realized Cap (USD) $t1N * \sum_{n=tt-N}^n$ Daily On-Chain Transaction Volume (USD) n	Analogue that values each UTXO at the price when it was last moved on-chain, rather than the current price	RVT behaves inversely (note use of thresh_inverse=True in charting function) to NVT(S).
Mayer Multiple	Compares the current price to a 200 day moving average of the historical price.	BTC/USD $\text{Price}t1200 * \sum_{n=tt-200}^n \text{BTC/USD Price}n$	Mayer Multiple is calculated solely from price data and does not attempt to incorporate any on-chain data inputs.	
Realized capitalization	Realized capitalization values each coin at the time of its last on-chain movement.			Each on-chain movement represents a transfer of ownership between a willing buyer and willing seller.

Source:

<https://docs.coinmetrics.io/>

<https://chatgpt.com/>