maha ADVISORS

Maha – CoinGecko

Digital Asset Index Methodology

I. Background

The Maha - CoinGecko Digital Asset Index (MAGIX) was created based on the belief there is a gap that remains to be filled within the growing crypto ecosystem. While total market capitalization is a good measure of market growth, this number is subject to constant inflation from mining activities and the issuance of new tokens. From an investor's perspective, a 10% growth in this number does not necessarily translate to a 10% return on their investment. While traders and researchers often circumvent this issue by analyzing the price of a single asset, Bitcoin, recent growth in the blockchain space has rendered this metric insufficient. Bitcoin now constitutes just half of the total free-floating market capitalization, and it is inaccurate to base investment performance off this single number alone.

The Maha - CoinGecko Digital Asset Index aims to fill this gap and serve as a benchmark for investment return across all crypto assets. Constructed using a chain-weighted Laspeyres model and guided by a simple market cap weighted approach, MAGIX provides an inflation resistant objective metric for the overall performance of crypto markets. With five years of historically back-tested data and live data updated every five minutes, this index will serve as a valuable tool for investors and researchers alike.

II. Methodology

Index Selection Criteria

The Maha - CoinGecko Digital Asset Index aims to mimic the investment return of crypto markets as a whole. With this in mind, MAGIX employs a simple set of criteria to remain as objective as possible in the selection process, while still providing high quality information. These criteria are as follows:

1. The asset price is free floating. This excludes “stable-coins”, such as Tether and TrueUSD, whose exchange rate is not free-floating.
2. The asset price has sourceable trading data from at least one reputable publicly accessible exchange. Excluding assets listed on non-public exchanges reduces the chances of price manipulation. Historical data shows that all assets that refused listing on public exchanges have had a long run price trend to zero, as they were fraudulent schemes.
3. The asset must reach a circulating market capitalization equivalent to .1% of the total free-floating market capitalization for all cryptocurrencies. This percentage threshold is based off of the minimum market capitalization requirement for equities to be considered for listing on the S&P 500 stock index, a well known market index that tracks US equities. As of March 2017[1], companies listed on the S&P 500 must maintain a market capitalization of $6.1 billion. At the time, the S&P 500 had an adjusted float total market capitalization of $22.5 trillion, translating to a roughly .025% market capitalization requirement. Given the high volatility and low public float of many cryptocurrencies, a stricter requirement of .1% has been chosen to ensure a certain level of quality, while not remaining prohibitively high.
4. The asset price must maintain this .1% threshold for 12 consecutive weeks. This is to prevent the effects of short term price spikes, while still capturing early stage assets.

[1] https://www.cnbc.com/2017/03/20/sp-launches-new-market-cap-rules-first-solar-shares-fall.html

Index De-listing Criteria

Asset de-listing criteria is as follows:

1. The asset trades at less than .02% of Maha - CoinGecko Digital Asset Index total market cap for more than 90 consecutive days.
2. The asset fails to meet a newly added listing requirement.

Index Modeling

The Maha - CoinGecko Digital Asset Index is based off a Laspeyres index modeled by the following:

$$P_t = \frac{\sum_0^i P_{it} Q_{i0}}{\sum_0^i P_{i0} Q_{i0}}$$

The Maha - CoinGecko Digital Asset Index value is calculated by the following:

$$MDCValue_t = \frac{\sum_0^i P_{it} Q_{it}}{Divisor_t}$$

Where:

MAGIXValue = index level

t = time

i = asset identifier

P = asset price

Q = asset circulating supply

Divisor = chain weighted dividing factor that adjusts for inflation and changes in index constituents

As described above, the present index value is calculated by summing the current total market capitalization of all constituent assets, divided by a *Divisor*. The *Divisor* is weighted by changes in market capitalization due to changes in circulating supply and asset listings/de-listings between each index re-evaluation. This gives an inflation adjusted figure that makes changes in asset prices the only causal factor to index value.

A base index value of 100 was chosen on April 28, 2013 to get the initial *Divisor*, resulting in an initial value of:

$$Divisor_0 = \frac{\sum_0^i P_0 Q_0}{100} = 15,875,182.80$$

Subsequent *Divisor* calculations are done as follows:

$$Divisor_t = \frac{\sum_0^i P_{t-1} Q_t}{MDCValue_{t-1}}$$

This adjusts for any changes in market cap caused by inflationary activities or listing/de-listing of new currencies. Because this Divisor is re-calculated for each new index price level, the MAGIX Index value is accurate with high frequency data and does not require any manual re-balancing.

Index Oversight

The Maha - CoinGecko Digital Asset Index is owned by Darius Avens, and is administered and branded by Maha Advisors LLC.

Maha Advisors LLC will periodically review the Index in order to achieve its goal of providing the best representation of crypto markets as a whole. This review may include, but is not limited to, changes in asset selection criteria, changes in asset de-listing criteria, changes in Index update frequency, changes in Index value

computation, and changes in live data source and sourcing frequency. Any such changes will be publicly announced.

IV. Data Sourcing

Live Data

The Maha - CoinGecko Digital Asset Index value is updated every five minutes from coin price and circulating supply data provided by the CoinGecko.com API.

Price data refers refers to the current global volume-weighted average USD denominated price of a cryptoasset traded on an active cryptoasset exchange as tracked by CoinGecko.[2] CoinGecko updates their coin price data every 5 minutes and currently includes more than 300 cryptoasset exchanges.

Circulating supply data refers to the total number of tradable coins for each cryptoasset. CoinGecko updates this data every 5 minutes via API endpoints provided by each respective project. All index values after March 11, 2019 are calculated using this high frequency data.

Historical Data

Index values prior to March 11, 2019 are calculated using historical data provided by Coingecko. This data is sourced at a daily interval going back to April 28, 2013. Circulating supply data during this period is calculated by dividing total market capitalization by current price at the time of the daily price sourcing.

[2] https://www.coingecko.com/en/faq

Historical index performance is back-tested from day 1 using the Index Selection Criteria (Section II). Under this backtesting methodology, MAGIX Index historical data avoids any potential selection bias for this time period. For example, long term winners, such as Ethereum, are only included alongside long term losers, such as Megacoin, since they both met the selection criteria at one point in time. Adhering to this methodology is important, as it allows Maha Digital Index to provide an accurate measure for investment return prior to becoming a live updating data source.

Data Methodology

More information regarding data aggregation methodology can be found at the following URL: https://www.coingecko.com/en/methodology