



BNC.

BUILDING INVESTMENT
STRATEGIES WITH THE
GENERAL TAXONOMY FOR
CRYPTOGRAPHIC ASSETS

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About Brave New Coin

Brave New Coin's mission is to be the leader in delivering the most accurate, accessible, and comprehensive blockchain data solutions and insights, in ways that anticipate and respond to the needs of an evolving market.

BNC is committed to providing the type of trusted information, technical analysis and research that will empower and inform stakeholders across the cryptographic asset marketplace.

To that end, The General Taxonomy for Cryptographic Assets has been curated to deliver on the goal of a comprehensive asset classification system which provides a common frame-of-reference for all sector participants.

Author Profile



Rafael Delfin (BEcon) is the Head of Research at Brave New Coin. With a background in economics, his dominant academic focus lies at the intersection of quantitative finance, cryptographic assets and the nascent discipline of crypto economics. Rafael is a member of several industry organizations promoting distributed ledger technology solutions including the Bitcoin Foundation, the North American Blockchain Association, and the Government Blockchain Association. His 2014 thesis "The Fractal Nature of Bitcoin: Evidence from Wavelet Power Spectra," was published in Springer's 2016 Trends in Mathematical Economics.

An Introduction into the First Use Case Study

The first article in this use-case series, "Building Investment Strategies With The General Taxonomy For Cryptographic Assets", will be devoted to individual and institutional investors. We will show how BNC's General Taxonomy for Cryptographic Assets can be incorporated in the decision-making process to create a wide range of investment strategies based on over 60 key qualitative and quantitative metrics for cryptographic assets.

Before showcasing how BNC's General Taxonomy for Cryptographic Assets can be used and add value for industry participants, the introductory article, "An Introduction to The General Taxonomy Use Case Series", established some of the most effective principles to date for the valuation of cryptographic assets. In summary, these were:

- i) estimating the potential demand of Bitcoin and crypto assets in general based on the current industries and infrastructure they can potentially capture.
- ii) estimating future adoption using the growth of daily transaction volume in the Bitcoin network as a proxy.
- iii) estimating the present value of Bitcoin using Metcalfe's valuation framework.

This article will use some of these approaches and additional frameworks to:

- i) Develop an index/basket of crypto assets based on BNC's General Taxonomy for Cryptographic Assets.
- ii) Provide an estimated valuation and three-year return for this basket.

Crypto Asset Basket Methodology

This basket will be made up of both General Cryptographic Assets (GCA) and Protocol Tokens (PT), with a larger GCA component given their ability to simultaneously replicate the fundamental economic properties of Robert Greer's three superclasses of assets (i.e. as Capital Assets, Commodities, and Store of Value Assets). For the Protocol Token component of this basket we have opted to focus on two established industries that can be easily quantified and will be facing increasing competition by DLT-based assets: Cloud Storage, including the market of High Performance Computing, and Wealth Management.

Table 1 below shows a list of the crypto assets selected for this use case, along with some of the metrics tracked by General Taxonomy for Cryptographic Assets. For a full view of all the metrics tracked by General Taxonomy please go [here](#).

Table 1. Cryptographic Asset Components for the Index Studied in this Use Case

Asset	Ticker	GTCA Family	GTCA Sub-Classification	Niche Industry
Bitcoin	BTC	GCA	Payment Cryptographic Asset	Cryptocurrency
Ethereum	ETH	GCA	Platform Cryptographic Asset	DApp Platform
Zcash	ZEC	GCA	Payment Cryptographic Asset	Private Payments
Ripple	XRP	GCA	Payment Cryptographic Asset	Financial Services
Litecoin	LTC	GCA	Payment Cryptographic Asset	Cryptocurrency
Siacoin	SC	GCA	Platform Cryptographic Asset	Distributed Storage
Elastic	XEL	GCA	Platform Cryptographic Asset	Distributed Computing
Waves	WAVES	GCA	Platform Cryptographic Asset	DApp Platform
Dash	DASH	GCA	Payment Cryptographic Asset	Private Payments
Monero	XMR	GCA	Payment Cryptographic Asset	Private Payments
Lisk	LSK	GCA	Platform Cryptographic Asset	DApp Platform
OMNI	OMNI	GCA	Payment Cryptographic Asset	Stable Cryptocurrency
MaidSafeCoin	MAID	PT	Application Token	Distributed Computing & Storage
Golem Network	GNT	PT	Application Token	Distributed Computing
Storj	STORJ	PT	Application Token	Distributed Storage
ICONOMI	ICNX	PT	Application Token	Crypto Asset Management
Melon	MLN	PT	Application Token	Crypto Asset Management
TaaS	TAAS	PT	Application Token	Crypto Asset Management

The first issue to address for the creation of this index is that of market capitalization. The use of this metric has been questioned a number of times for several reasons. Among the most prominent are **i)** the continuous issue of new tokens to the circulating supply and the permanent loss of early coins are not properly taken into account; **ii)** the notion of market capitalization comes from the equity markets and (some) crypto assets do not have cash flows; **iii)** when using the market cap indicator, it should be computed based on outstanding supply rather than circulating supply as per basic valuation principles; and **iv)** adding to these issues is the factor of liquidity, since having a large market cap does not guarantee that a token has the required volume to withstand large amounts of buying and/or selling orders.

Having said this, the market cap indicator is still a metric widely used by investors to quickly assess total valuation of a crypto asset. Rather than completely forgoing its use, we propose the use of an indicator that both explicitly informs investors of the shortcomings of this metric and also addresses, to a possible extent, the main concerns expressed above.

Regarding the issues of continuous supply, which could be seen as analogous to a stock split, and permanent loss of coins, we argue that this has been mostly priced-in by the market. One factor supporting this argument is the price and volume decrease, and subsequent recovery, during the first week of May of 2016 when Australian academic Craig Wright claimed to be Satoshi Nakamoto and investors feared the estimated 1 million bitcoins belonging to the anonymous creator would flood the market. Additionally, this concern can also be addressed by using an average circulating supply metric in valuation exercises, as shown by Needham's [2016a](#) and [2016b](#) valuation frameworks and more recently by [Chris Burniske](#).

The second issue listed above, that cryptographic assets do not have cash flows, is only partially true since there are several cryptographic assets, both GCA and PT, that do have cash flows.

Examples of different cash flow models in cryptographic assets go from Public Proposal Systems (Decred) and Decentralized Governance (Dash) to company/foundation based (Ethereum, Zcash, Stellar, Lisk), to crowdsourced ones (Bitcoin, Litecoin, Monero).

As to the third concern, there's an [argument](#) to use an asset's circulating supply, instead of its outstanding supply. The reasoning behind this argument is that locked and reserved coins are not able to be sold on to the public, and thus cannot affect the price, and should not affect market capitalization. This practice is analogous to the public float method for determining market capitalization in traditional finance. Indeed, this approach is used by [MSCI](#), [FTSE](#), [S&P](#) and [STOXX](#), among many other major index providers.

We consider this reasoning to be partially correct, however, since the public float methodology is mainly used for securities belonging to an index. Therefore, we propose the market capitalization indicator to be estimated using the outstanding supply metric when independently assessing the total valuation of a crypto asset, and circulating supply when valuing assets that are part of a market index.

It is worth noting that it is not always straightforward to determine the total supply of a given crypto asset as the development team or governing body has not put in place a definitive monetary policy. One of BNC's goals with the launch of General Taxonomy and the publication of the accompanying use-case series is to encourage the creation of community-wide best practices regarding the publication of standardized protocol and key metrics for asset specifications by development teams right in the genesis block. This will be the subject of a dedicated use-case article.

Finally, to deal with the issue of liquidity a "Volume to Market Capitalization" ratio will be added to the weight of each asset in the basket, which will assign a higher weight to assets with higher liquidity.

Current Valuation and Estimation of Future Returns for Test Basket

Below are the metrics to be used for the construction of the General Taxonomy for Cryptographic Assets based index:

Free Float Market Capitalization:

Market capitalization indicator estimated using the cryptographic asset's end of day (Dec 31, 2017 UTC) public float, or circulating supply.

24hr Volume:

Cryptographic asset's end of day (Dec 31, 2017 UTC) 24hr traded volume.

Liquidity to Market Cap Ratio:

Cryptographic asset's 24hr Volume divided by the Free Float Market Cap.

Free Float Factor:

Cryptographic asset's Public Float divided by its Outstanding Supply.

Total Weight Factor:

Sum of Liquidity to Market Cap Ratio and Free Float Factor.

Asset Weighted Capitalization:

Asset's Free Float Market Cap multiplied by Weight Factor.

Asset Weight within the index:

Asset's Weighted Capitalization divided by the basket's Total Weighted Cap.



Table 2. Index Constituents and Metrics Used to Construct the Basket

31st December 2017 UTC

Asset Name	Current Free Float	24hr Volume	Liquidity/FFCap Ratio	Free Float Factor	Total Weight Factor	Weighted Cap	Asset Weight
Bitcoin	16,776,450	\$4,481,283,425	1.91%	0.80	0.82	\$191,484,222,878.75	58.23%
Ethereum	96,690,240	\$1,556,289,843	2.18%	1.00	1.02	\$73,107,067,443.00	22.23%
Ethereum Classic	98,781,059	\$205,166,941	7.38%	0.43	0.50	\$1,398,575,784.35	0.43%
Zcash	2,957,681	\$92,455,683	6.21%	0.14	0.20	\$302,183,948.80	0.09%
Ripple	38,739,144,847	\$4,904,552,340	5.63%	0.39	0.44	\$38,673,034,313.42	11.76%
Litecoin	54,559,007	\$734,845,004	5.78%	0.65	0.71	\$8,991,602,885.48	2.73%
Siacoin	31,396,146,153	\$27,446,541	2.91%	0.69	0.72	\$675,945,220.78	0.21%
Elastic	88,355,630	\$1,089,513	1.87%	0.88	0.90	\$52,613,847.53	0.02%
Waves	100,000,000	\$50,580,138	4.02%	1.00	1.04	\$1,308,580,138.00	0.40%
Dash	7,786,871	\$156,092,685	1.90%	0.44	0.46	\$3,773,227,147.45	1.15%
Monero	15,546,731	\$102,341,216	1.90%	0.84	0.86	\$4,635,850,885.57	1.41%
Lisk	116,522,900	\$65,554,450	2.74%	1.03	1.06	\$2,541,943,535.23	0.77%
OMNI	615,054	\$3,151,299	5.39%	1.00	1.05	\$61,499,890.35	0.02%
MaidSafeCoin	452,552,412	\$8,981,367	2.11%	1.00	1.02	\$434,380,634.28	0.13%
Golem Network	1,000,000,000	\$17,038,238	2.03%	1.00	1.02	\$857,038,238.00	0.26%
Storj	126,000,000	\$69,049,087	22.74%	0.30	0.52	\$159,075,346.25	0.05%
ICONOMI	99,788,314	\$6,786,096	2.48%	1.00	1.02	\$279,627,284.54	0.09%
Melon	749,400	\$1,129,705	1.15%	0.60	0.61	\$60,259,483.70	0.02%
TaaS	8,146,000	\$843,361	1.73%	1.00	1.02	\$49,719,361.00	0.02%

Drawing from Needham's 2016 valuation approaches to bitcoin, we will use the Quantity Theory of Money framework to estimate the potential value of this basket of cryptographic assets by year 2020. It is worth noting that in little over 12 months of Needham's [2016](#) revised bitcoin valuation, the cryptographic asset went from being 6% the size of the global gold ETF market to 2.77 times its size, surpassing the firm's 2020 target estimates by over 7.5 times.

The total market capitalization of this basket of cryptographic assets, based on a free float methodology, equals \$430 bn, 70% of the total free float market capitalization for the cryptographic asset industry.

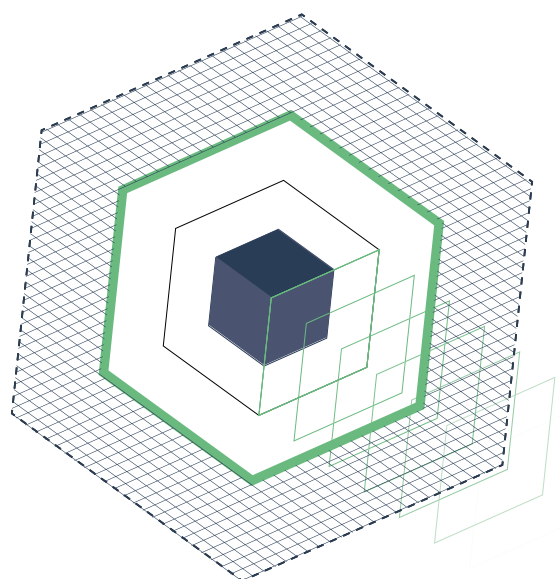
As of today this basket's total free float market capitalization represents 0.54% the combined market sizes of [global investable assets](#) and [public cloud services](#) (including [high performance computing](#)), of \$78.7 tn and \$246 bn respectively. Based on recent positive market and regulatory developments for the cryptographic asset space, ¹ we argue by 2020 this basket is poised to capture 1 to 5 percent of the combined market size of the industries covered by this basket.

The estimates previously referenced for the 2020 market size of global investable assets and public cloud services put this figure around \$112.419 trillion, which would equate to the test basket capturing \$1.12 to \$5.62 trillion of these combined markets. These lower and upper values amount to the size or GDP of the basket's economy, i.e. the P-Q terms of the Quantity Theory of Money (QTM) framework. Since 99% of the market capitalization of this basket corresponds to General Cryptographic Assets, i.e. assets that are best suited to serve as a long-term store of value, we will use [Burniske's](#) annual estimated bitcoin velocity of 6.5, ² which amounts to a basket valuation range of \$172.3 bn to \$864.6 bn.

Already the basket's monetary base is big enough to support 1% of the combined markets of global investable assets and public cloud services. However, while the the basket would "only" need to double its market capitalization to reach the higher 5% monetary base, we haven't taken into account an estimated 11.7% weighted increase in the overall circulating supply of the assets making up this basket. This means that in order to preserve its current purchasing power the basket would have to maintain a free float capitalization of at least \$480.31 bn.

Should the test basket maintain this minimum capitalization by 2020 it will be have captured 2.78% of the combined markets of global investable assets and public cloud services. Given the rapid rise of this nascent asset class, even capturing a 5% market share by 2020 of the global investable assets and public cloud services might prove conservative as cryptographic assets become increasingly adopted.

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Conclusions

This use-case article has presented individual and institutional investors with the basic scaffolding to create an investment strategy using the General Taxonomy for Cryptographic Assets with some of the most comprehensive frameworks to assess crypto asset valuations.

The basket presented in this study can aid both active and passive investment, by enabling active managers to benchmark their fund returns vis-à-vis an investable index, and facilitating a perfectly replicable portfolio of cryptographic assets with the least tracking error for passive managers. Moreover, Brave New Coin's General Taxonomy for Cryptographic Assets allows for the creation of a wide range of customizable investment strategies and indices. The different approaches that can be used to construct a basket of crypto assets include:

Family specific:

Only focusing on either General Cryptographic Assets or Protocol Tokens. The advantages and disadvantages of this approach relies on the degree of detail covered by the former and the latter, respectively.

Subclass specific:

Only selecting either Payment or Platform Cryptographic Assets, Side Chains or Application Tokens.

Industry specific and Industry Rotation:

By using either the North American Industry Classification System (NAICS) or Niche Market metrics. A NAICS-based basket can act as either an industry-specific or rotation strategy but with an implicit subclass focus since Protocol Tokens are limited in their store of value economic properties, and only these are assigned a NAICS classification. The Niche Market metric on the other hand is assigned to every single asset indexed by BNC, allowing for a more diversified portfolio that can still be industry-specific or rotational.

Filtered by custom Key Metrics:

Thanks to the 60+ metrics tracked by the General Taxonomy for Cryptographic Assets, asset managers can create baskets based, for example, on mining hardware requirements (filtering assets by their consensus algorithm), liquidity profile (by focusing on interest generating PoS-based tokens), platform preference (e.g. BTC, ETH, ETC, WAVES, UMQ-only issued assets), or privacy preference.

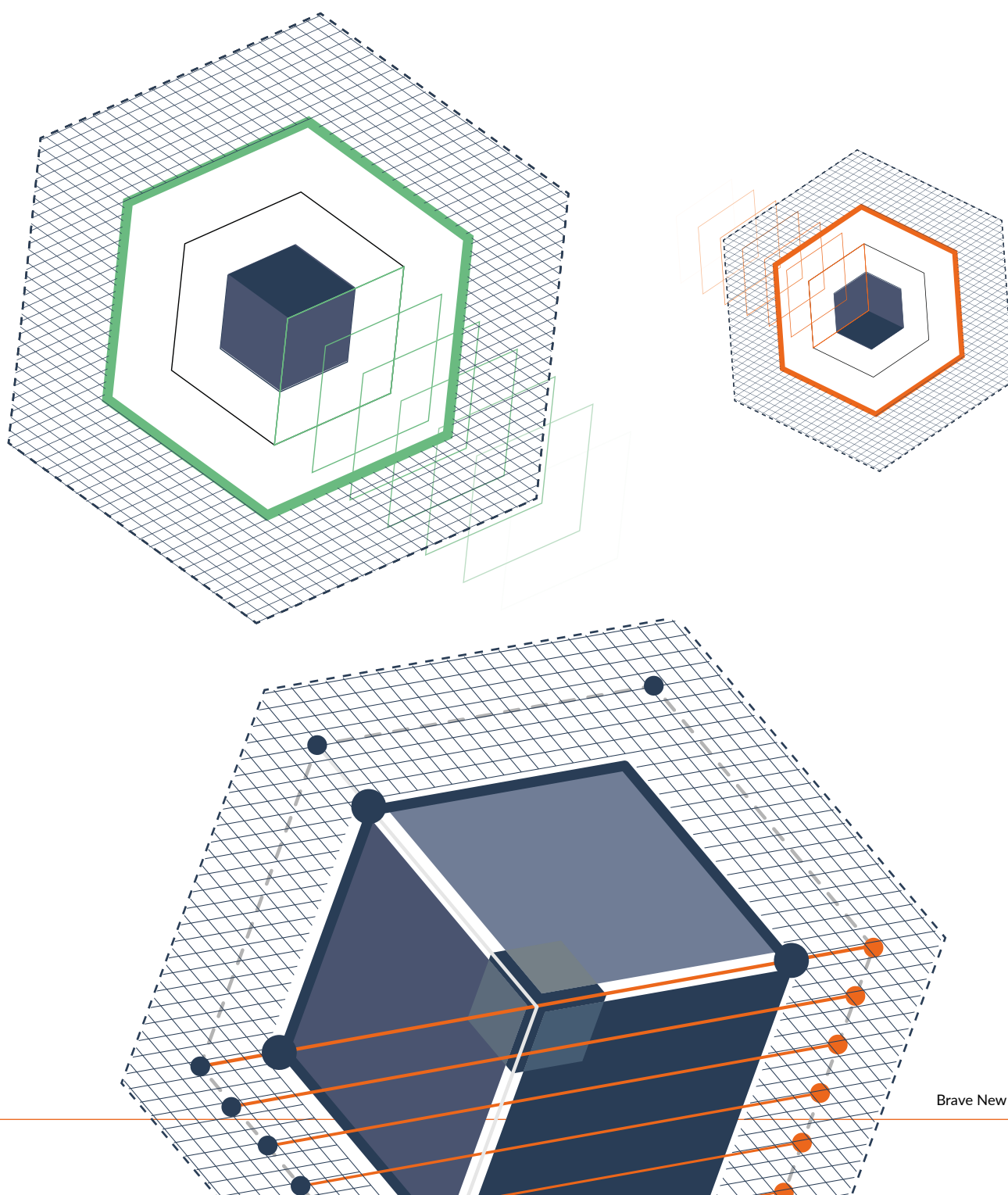
While this is certainly an introductory exploration on cryptographic assets' metrics-based index development, we will expand on the question of how to better assess the value of the diverse cryptographic asset class, with the goal of advancing the investigation of the assets being classified by the General Taxonomy for Cryptographic Assets.

Areas of future research on the area of metrics-based cryptographic indices or baskets include determining whether a capped weight for index components maximizes an index return, and the optimal weight cap if this is the case; as well as the optimal parameter for both the number of index constituents and rebalancing frequency.

Footnotes

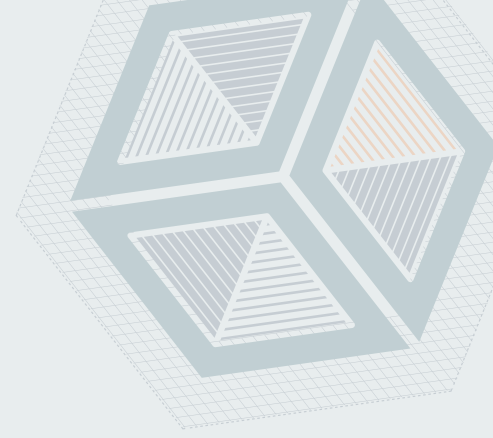
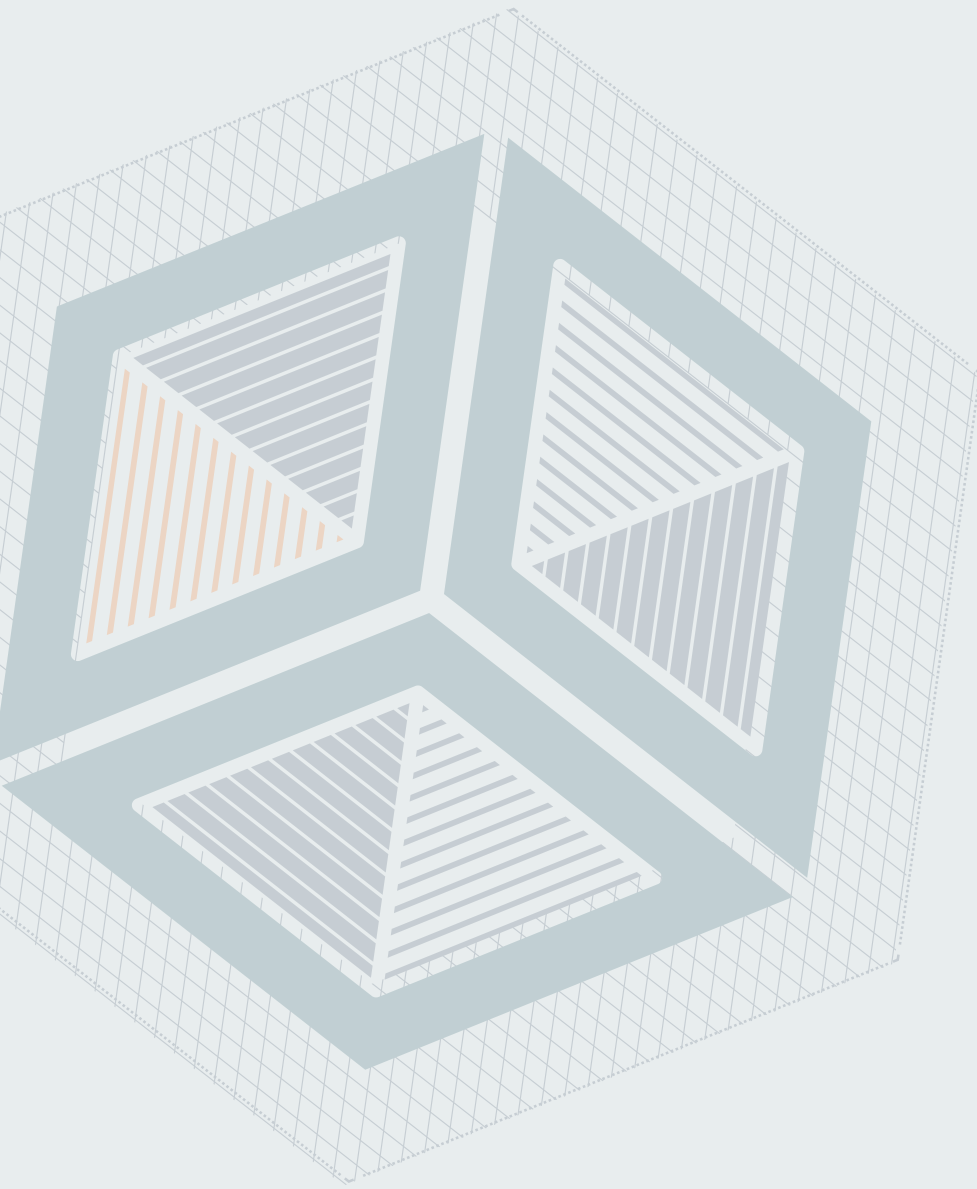
¹ This is evidenced by the U.S. Commodity Futures Trading Commission's approval for registration of LedgerX LLC to clear and custody financial instruments backed by any number of crypto assets, the U.S. Securities and Exchanges Commission appointment of Dalia Blass, previously advising the Winklevoss brothers in their bitcoin ETF bid, as a new director of the agency's division in charge of ETFs, as well as recent announcements by both CME Group and CBOE to launch markets for bitcoin futures contracts.

² This velocity is similar to that of USD M2 money supply, i.e. liquid non-cash assets mostly held for long-term savings.



References

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Taxonomy

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