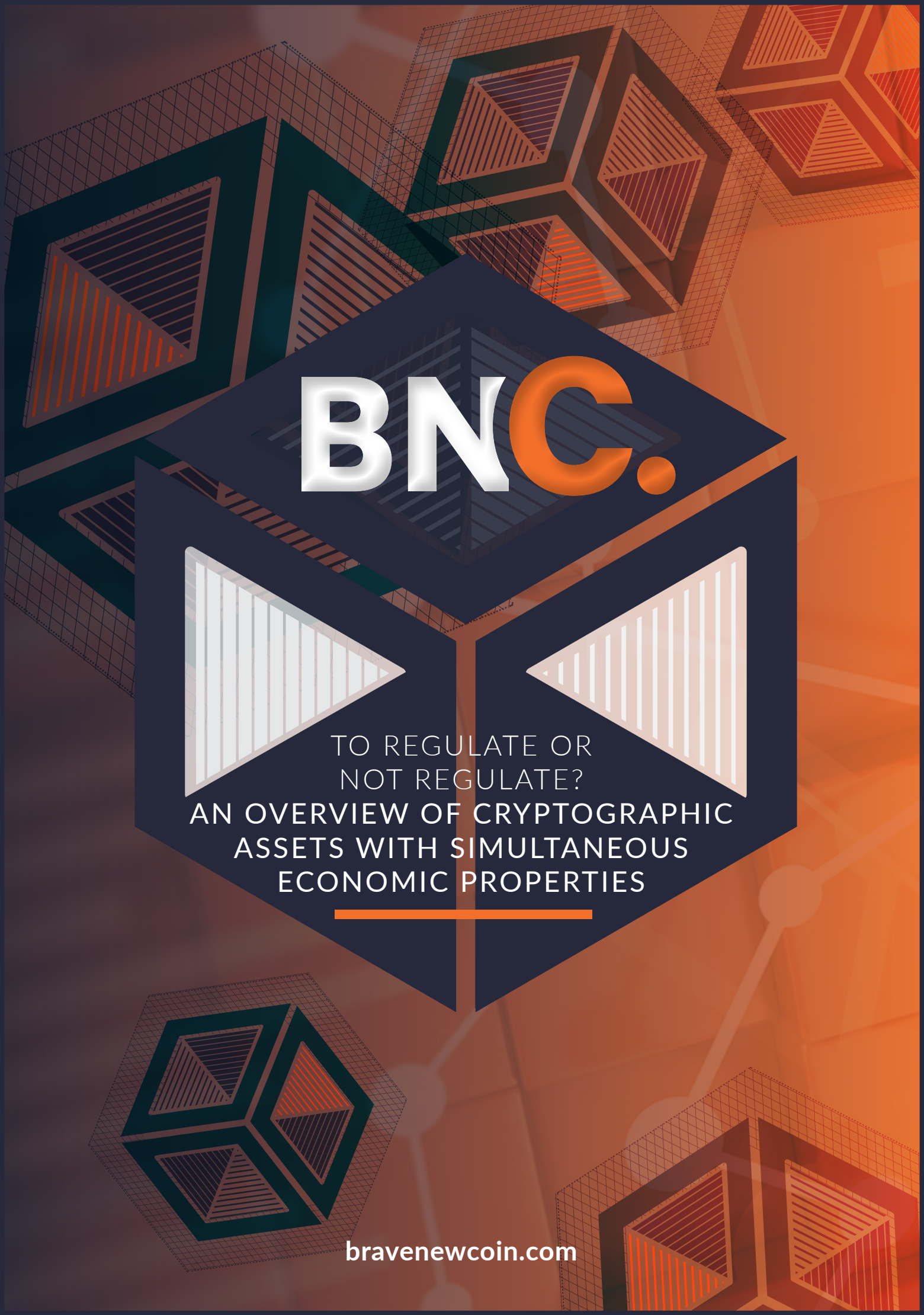
BNC.
TO REGULATE OR
NOT REGULATE?
AN OVERVIEW OF CRYPTOGRAPHIC
ASSETS WITH SIMULTANEOUS
ECONOMIC PROPERTIES
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About Brave New Coin

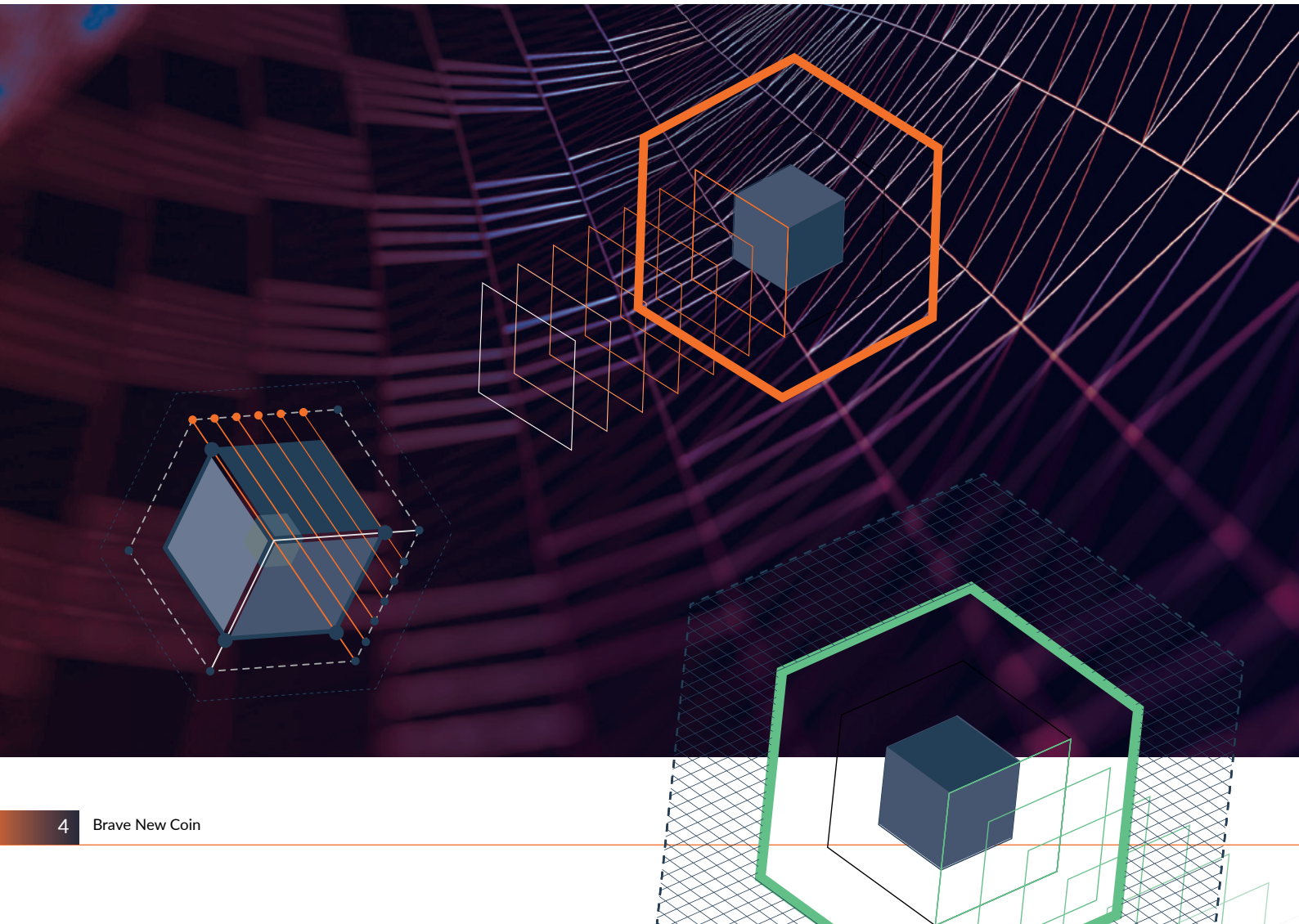
Brave New Coin's mission is to be the leader in delivering the most accurate, accessible, and comprehensive blockchain data solutions and insights, in ways that anticipate and respond to the needs of an evolving market.

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.



Overview

This use case article will study the economic properties of cryptographic assets that can simultaneously behave as capital assets, commodities, and a store of value; as well as showing how these particular assets can be identified using our newly launched API.

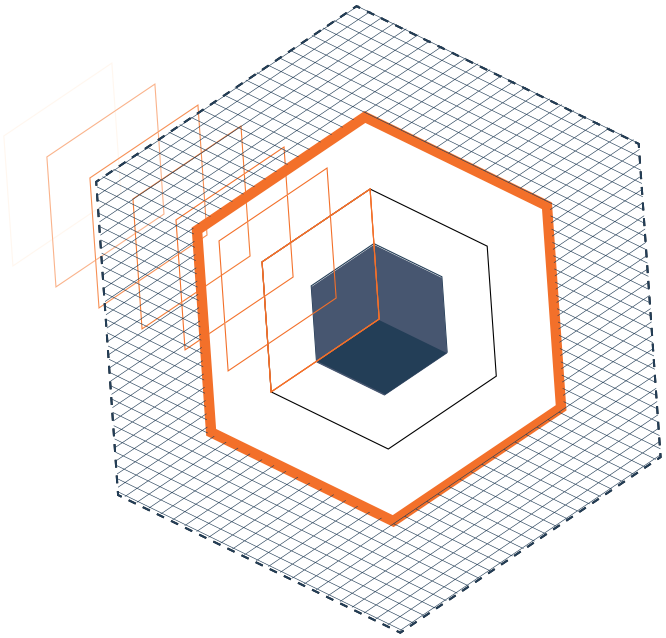
On June 4th, U.S. Commodities Futures and Trading Commissioner Rostin Behnam delivered a speech to the United Nations where he stated that these cryptographic assets "will proliferate to every economy and every part of the planet." Commissioner Behnam elaborated that some places, "small economies," may become dependent on these assets for survival. "We are witnessing a technological revolution. Perhaps we are witnessing a modern miracle" (see U.S. CFTC 2018).

While Behnam describes widespread proliferation, there is also a lack of consensus regarding the nature and classification of bitcoin and similar assets. The framework presented in the General Taxonomy of Cryptographic Assets (GTCA) describes cryptographic assets as an entirely new superclass of financial assets.

The main argument for this classification is a shared fundamental economic property; their ability to simultaneously behave, to varying degrees, as two or more traditional asset classes. Robert Greer (1997) defined three superclasses of financial assets; capital assets, which provide a periodic source of revenue; consumable/transformable assets, which are goods used as a primary input to produce a final good/service; and store of value assets, which can vary in value significantly, but rarely lose all of their value.

For example, Bitcoin can be considered both a commodity, as it does not generate a stream of future cash flows but can be used as raw material with substantial fungibility, and a store of value, given its portability, auditability, divisibility, scarcity, and censorship resistance. While other cryptographic assets[1] can behave as all three superclasses of asset since their functionality allows the token to provide cash flows under certain conditions.

The GTCA can be used to identify whether a specific cryptographic asset exhibits these economic properties, uniquely or simultaneously, and is designed for use in many niche areas. This article will focus on how government agencies around the world can inform their regulatory approach to cryptographic assets, based on their shared unique economic properties.



1 See Dash, Decred, Lisk, EOS, NEO, Waves, Cardano, and eventually Ethereum's switch to PoS.

Section I:
Are cryptographic assets currencies?

The seminal White Paper, *Bitcoin: A Peer-to-Peer Electronic Cash System* (see Nakamoto 2009), defines a cryptographic asset that operates as electronic cash, with the ability to facilitate online payments without relying on a financial institution. This property, acting as a medium of exchange, is one of three basic functions of money. The remaining two properties are being a unit of account and a store of value.

Cryptographic assets have proved to be a reliable medium of exchange for numerous financial transactions. The niche industries of venture capital and distributed investing have know begun to take note, with the rise of what is known as the Initial Coin Offering (ICO). At the same time, as of July 2018, the percentage of bitcoin held as digital gold is estimated at 75% of current public float (Needham 2016) and boasts the same market capitalization as gold ETFs (World Gold Council 2018).

Nevertheless the currency status of cryptographic assets, including bitcoin, have been dismissed by academics (Yerkmack 2014), regulators (Buell 2017), and professionals (Dorfman 2017 and Shieber 2014). Some of the most used arguments against its recognition as a currency are i) low speed ii) high cost of transactions; iii) security/ease of use; and iv) deflationary supply. However, these arguments are either misplaced, soon to be obsolete, or irrelevant.

Criticism regarding bitcoin's high cost of transaction and low speed can now be dismissed thanks to the Segregated Witness soft fork change, implemented in August, 2017[2], and the implementation of the Lightning Network, which allows for nearly instant payments. As for security and ease of use, many people confuse the fact that cryptocurrency exchanges and wallet owners can get hacked, while the underlying protocol has proved to be the most secure computer network on the planet.

Regarding deflation, many high profile academics (Krugman 2011), professionals (Undercover Economist 2011), and publications (The Economist 2014a and The Economist 2014b) have deemed it as a disadvantage. The reasoning behind this argument is that an appreciating currency doesn't incentivize consumer spending. Consumers holding a currency that increases in value over time will be more inclined to save as much as possible, and delay purchases in expectation of lower relative prices in the future.

At the same time, deflation is considered an undesired economic phenomenon because it increases the real value of debt and has been associated with periods of economic depression in the U.S. The most notable of these periods being the Great Depression of 1930-1933.

However, a 2004 report by the Federal Reserve Bank of Minneapolis concluded that while deflation and depression do seem to have been linked in the U.S. during the 1930s not all episodes of deflation correspond with periods of poor economic growth. Data from 17 countries and more than 100 years showing no evidence of such a link.

Last but not least, the deflationary argument against bitcoin fails to take into account that cryptographic assets follow market cycles of significant price growth and decline, making in much more complicated in practice for deflationary based crypto assets to enter deflationary spirals. This last point brings us to the argument that volatility is excessive for some cryptographic assets, which degrades their currency status.

2 In late January 2018 for example, BitcoinTalk user "Loaded" moved 40,000 bitcoin ($400 million at the time) to a SegWit address while paying a $1 fee.

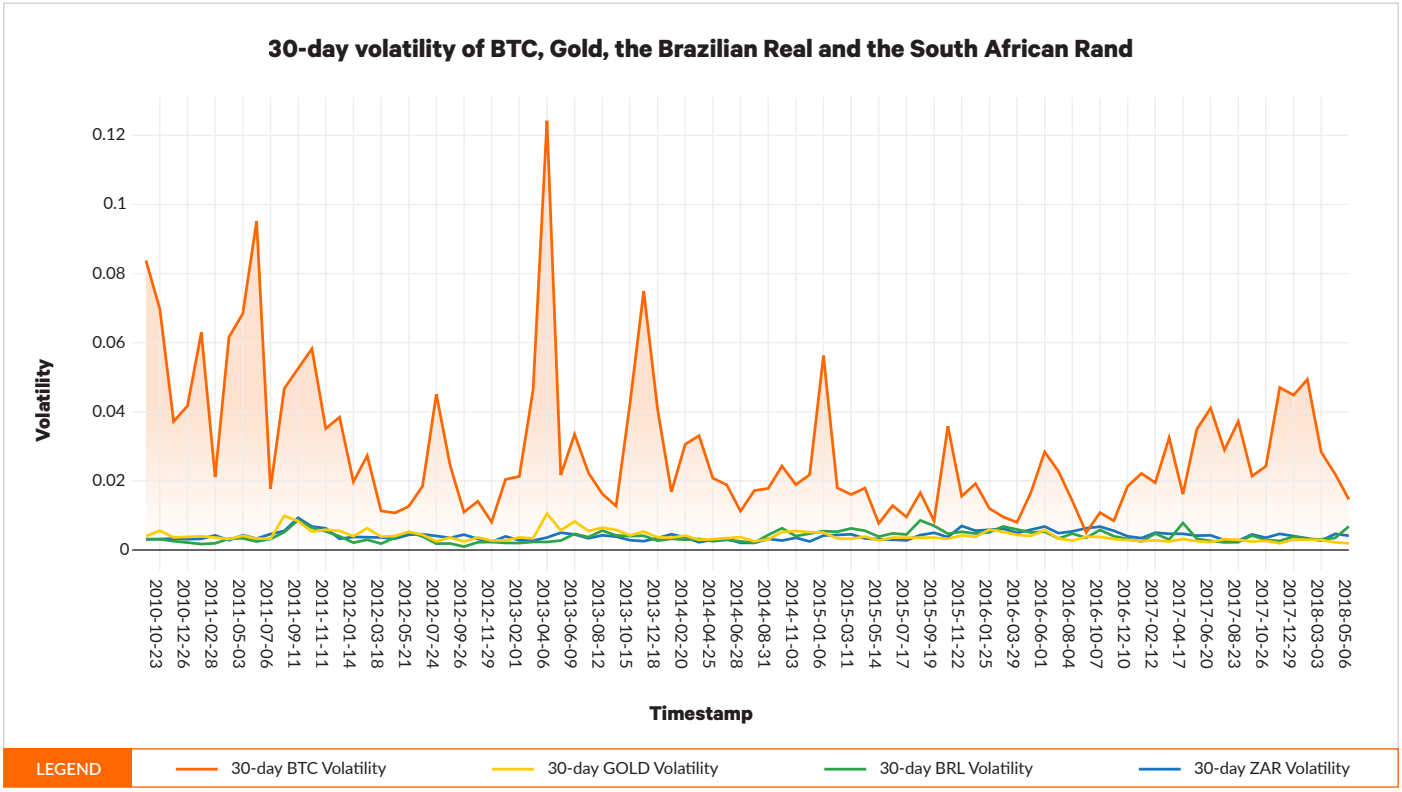


Figure 1

Due to bitcoin's high volatility its detractors argue that it cannot properly fulfill the functions of being a unit of account and store of value but as Figure 1 shows, bitcoin's volatility has been on a steady decline since it began trading.

Moreover, when compared with currencies in developed and developing states, it's worth noting that even though bitcoin boasts a significantly lower market capitalization and liquidity relative to any traditional store of value or national currency it has had volatility periods that have reached levels similar to that of gold, the Brazilian Real, and the South African Rand; as well as having reached similar volatility levels to the US dollar in mid 2015 and 2016.

Recent studies by BitMEX Research (2017) and Boyapati (2018) illustrate how a cryptographic asset can combine the advantages of both physical and electronic cash to serve as a medium of exchange, while scoring higher than gold and fiat currencies in several store of value dimensions. In a similar fashion, Goldman Sachs' Senior Economist Zach Pandl supports the idea that bitcoin can succeed as a form of money, and estimates that long-run cryptocurrency returns, and thus volatility, should approach low single digits.

As with the first set of arguments against bitcoin's currency-like nature, highlighting a crypto assets volatility to dismiss its ability to serve as a widely used form of money, or suitability to be part of a nation's foreign currency reserves, fails to take into account the asset's incredibly brief history when compared to other established assets. Using global internet adoption as a rough comparison, it took the technology 10 years (from Dec 1995 to Dec 2005) to reach 10% adoption, which is equivalent to 25x growth (Internet World Stats 2018).

While it's difficult to accurately determine the number of current bitcoin users worldwide, two popular metrics used as a proxy is the number of blockchain wallet users, 25 million as per June 2018 according to Blockchain.info, and wallets with more than 0.001 BTC, currently at 23 million according to Bitinfocharts. In March 2018, Coinbase alone reported serving over 20 million customers (Coinbase 2018). Given that Coinbase does not offer its services in some of the largest crypto markets by volume (e.g. Japan, South Korea), the 25 million figure for wallet users could be a closer estimate to the actual number of bitcoin wallet users.

Taking 25 million users as an initial assumption for current worldwide adoption of cryptographic assets and the internet's adoption rate between 1995 to 2002, this would mean that in the next seven years the industry could achieve a market capitalization equal or greater than that of the current value of all the Gold in the world, $7.94 trillion (Only Gold 2018), and a worldwide adoption of 8%.

These estimates are backed up by several industry players, both veterans and recent entrants. Both Jesse Powell, founder and CEO of Kraken, and Thomas Lee, co-founder of Fundstrat Global, have stated that crypto assets will reach a combined market cap of $1+ trillion during 2018 (Hacked 2018 and Katz 2018). Dan Morehead, Pantera Capital founder and CEO, has expressed an even higher valuation forecast stating the cryptographic asset market capitalization is currently undervalued by a factor of 10 to 100, valuing the combined cryptographic asset space between $4 to $40 trillion (Emsley 2018). Although Mr. Morehead did not provide a time frame for his estimate, his multi trillion dollar valuation for the combined cryptographic asset industry has been backed up by ETF veteran Matt Hougan (Russo 2018), now vice president of research and development at Bitwise Asset Management Inc., and the Chairman Emeritus of CME Group Leo Melamed (Uetake and Sano 2017).

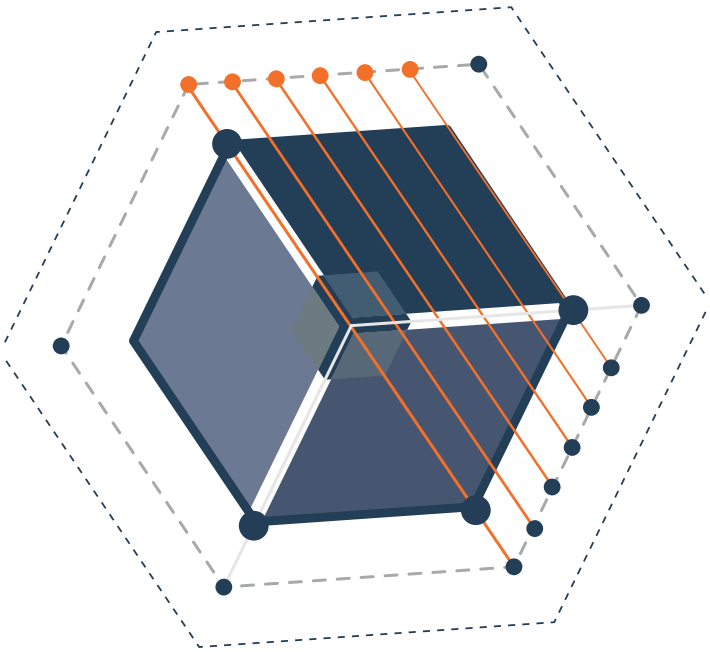
Since the current combined cryptographic asset capitalization represents 4.4% of the current value of all the gold in the world, and its technology has been adopted by roughly 0.32% of the world's population, this industry is still only being used by innovators in the technological adoption life cycle.

Should these forecasts materialize within the next 5-10 years, with cryptographic assets reaching parity with the total value of all the gold in the world and achieving an approximate 10% worldwide population adoption, it will both mark the next cycle of technological adoption for the industry (Early Adopters) and also pave the way for the third cycle (Early Majority). As the industry gains regulatory certainty, combined with institutional custodianship, brokerage and dealership services, and increased liquidity through derivatives markets, institutional investors will most likely lead the next wave of cryptographic asset adoption over the coming years.

For a significant number of industry stakeholders, some mentioned earlier, reaching a multi trillion valuation is not a matter of if but when[3].

Once multi-trillion crypto capitalization has been achieved it will become increasingly attractive and acceptable for national central banks to allocate a fraction of their foreign exchange reserves to crypto assets. Both the U.S. Federal Reserve and the European Central Bank have security and returns as their second and third objectives for the management of their foreign reserves, with liquidity being the first (Federal Reserve Bank of New York 2018 and European Central Bank 2018).

This in turn would facilitate goods, services, and central bank liabilities to be denominated in crypto asset units and consolidate some of the industry's assets as solid form of money.



3 Several authors and studies have presented evidence for an ever-accelerating rate of technology adoption that underlies cryptographic asset adoption. However, such discussion is outside the scope of this article. For more information Kurzweil (2005), Pew Research (2014 http://www.pewinternet.org/2014/03/11/digital-life-in-2025/), and The Economist (2014 https://www.economist.com/graphic-detail/2014/03/12/happy-birthday-world-wide-web)

Section II: Simultaneous economic properties

The first section of this article establishes how a cryptographic asset can in principle serve the most basic functions of money. In addition to performing as a currency, i.e. a store of value, the second section will study how a crypto asset can simultaneously behave as a commodity and/or a capital asset.

Since it's the first and simplest of its class, let's start with Bitcoin. It can be used as a raw material/ primary input to create other cryptographic assets, high-speed transaction platforms, and asset manipulation instructions thanks to its underlying scripting language. The mercurial nature of Bitcoin and other cryptographic assets can be seen through the diverse regulatory approach given by the United States.

According to guidance issued by the U.S. Financial Crimes Enforcement Network (FinCEN) in 2013, companies that exchange or transfer cryptographic assets are considered money-service businesses (MSB), see Royse (2013). The U.S. Commodity Futures Trading Commission (CFTC), on the other hand, has issued a ruling that treats bitcoin and other crypto assets as commodities covered by the Commodity Exchange Act (U.S. CFTC 2015). Meanwhile, in the judicial arena, U.S. courts have issued rulings arguing that bitcoin constitutes[4], and does not[5] constitute money, and that it is a commodity[6].

Meanwhile, in the judicial arena, U.S. courts have issued contradictory rulings on bitcoin's status as money. Judges Katherine B. Forrest, Jed S. Rakoff, and Hugh B. Scott have ruled that bitcoin is not considered a form of money, while judge Alison J. Nathan issued a ruling that considers bitcoin to be money, at least under the jurisdiction of the U.S. District Court for the Southern District of New York.

It is worth noting that one of these rulings has taken into account cryptographic assets with "capital asset" properties.

The General Taxonomy for Cryptographic Assets assigns the economic property of "Capital Asset" to any cryptographic asset that provides a periodic source of income, either directly or indirectly. Generally, crypto assets that provide a direct source of periodic income belong to the Application Token taxonomical classification. These tokens can provide a periodic income stream an explicit revenue sharing program, buy-back or burn mechanisms. Alternatively, crypto assets that provide an indirect source of income are generally tokens native to their own distributed ledger, have an initial and finite Proof-of-Work distribution period, support protocol voting rights, and are secured with an underlying hybrid Proof-of-Work and Proof-of-Stake, or exclusive PoS, consensus model. As with Bitcoin, these latter protocols can perform the basic functions of money (i.e. medium of exchange, unit of account, and store of value), and can also be used as a commodity/transformable, serving as the primary input to build other distributed networks, platforms, and tokens.

The significance of native protocol tokens that have not been not distributed through ICO's, but that can provide periodic source of income, is their ability to simultaneously behave as all three traditional super classes of assets, as defined by Greer (1997). However, not all income generating cryptographic assets can simultaneously behave as a capital asset, commodity and store of value. The following section will show how to identify cryptographic assets that exhibit broad multi-asset class nature and how to differentiate these from cryptographic assets with narrower economic properties, such as security-like ICO tokens and fully fledged tokenized securities.

4 United States v. Ulbricht, 31 F. Supp. 3d 540 (S.D.N.Y. 2014), United States v. Faiella, 39 F. Supp. 3d 544, 545 (S.D.N.Y 2014), United States v. Petix, 2016 WL 7017919 (W.D.N.Y. 2016).

5 United States v. Murgio, 209 F. Supp. 3d 698 (S.D.N.Y. 2016).

6 Commodity Futures Trading Commission v. McDonnell et al (1:18-cv-00361), New York Eastern District Court.

Section III:
Using the GTCA to study the economic properties of cryptographic assets

The defining characteristic of cryptographic assets that can simultaneously behave as a capital asset, commodity, and store of value is that they are a native token of an independent distributed protocol. These assets belong to the "General Cryptographic Asset" (GCAs) family established in the taxonomy framework.

Unlike income generating Protocol Tokens, which are issued on parent chains, distributed through an ICO, and are mostly focused in one niche market or industry sector, GCAs are generally distributed to network participants through an initial Proof-of-Work period, which is then complemented or replaced by a Proof-of-Stake phase. On top of having commodity and store of value properties, these assets provide a periodic source of income through Masternodes or staking rewards to network participants.

The General Taxonomy for Cryptographic Assets provides an API for users to identify these assets. Figure 2 below shows a graphic comparison of the market share captured by crypto assets based on the "Capital Asset" economic property. That is, based on whether these assets provide token holders with a periodic source of income and how this revenue stream is obtained. Crypto assets that explicitly provide a revenue sharing program, either through buybacks, dividends, airdrops, or burn mechanisms, are shown in orange. Crypto assets that don't directly provide passive income have been assigned a "Partial" value and are shown in red. As mentioned above, these are generally tokens with an underlying Proof-of-Stake consensus, or a PoS variant, and/or Masternode support.

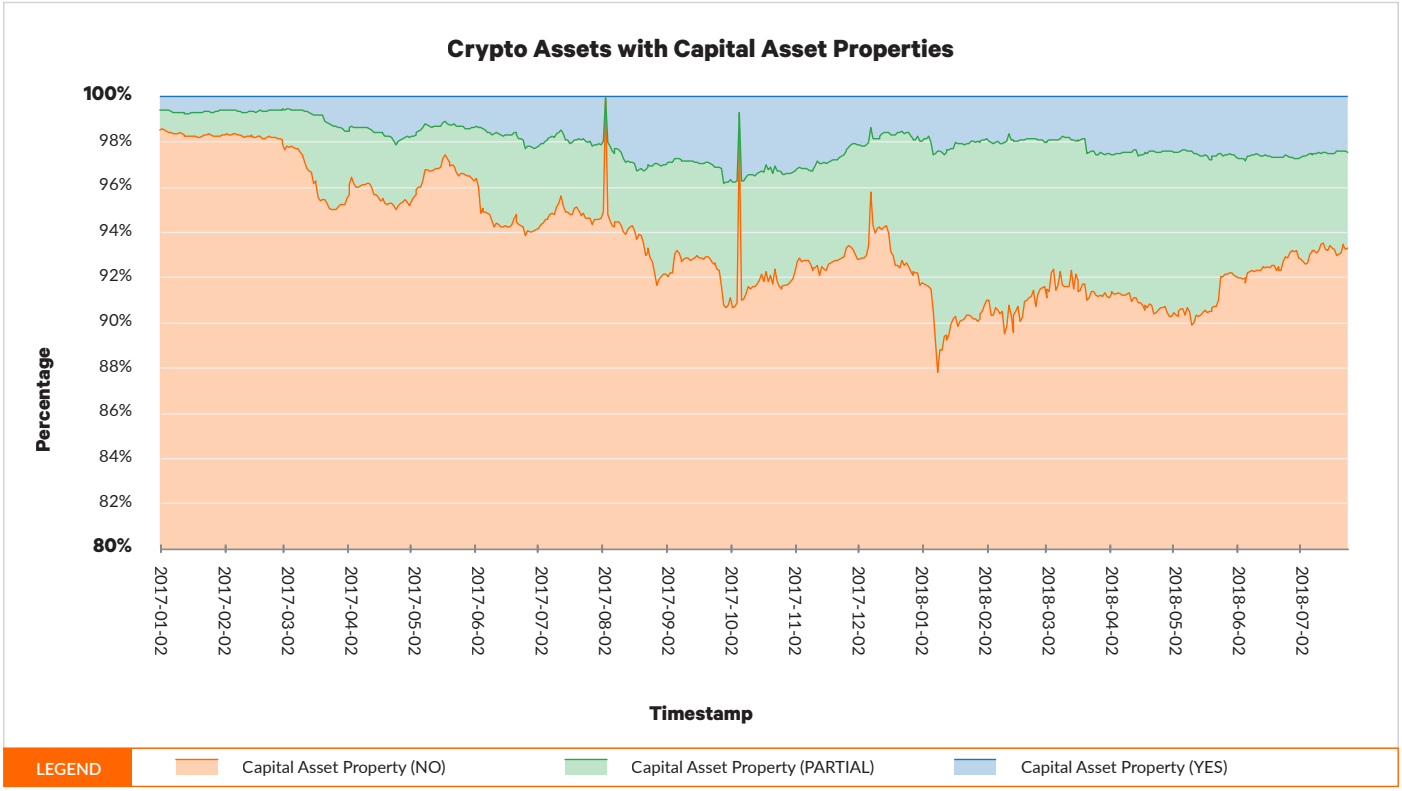


Figure 2

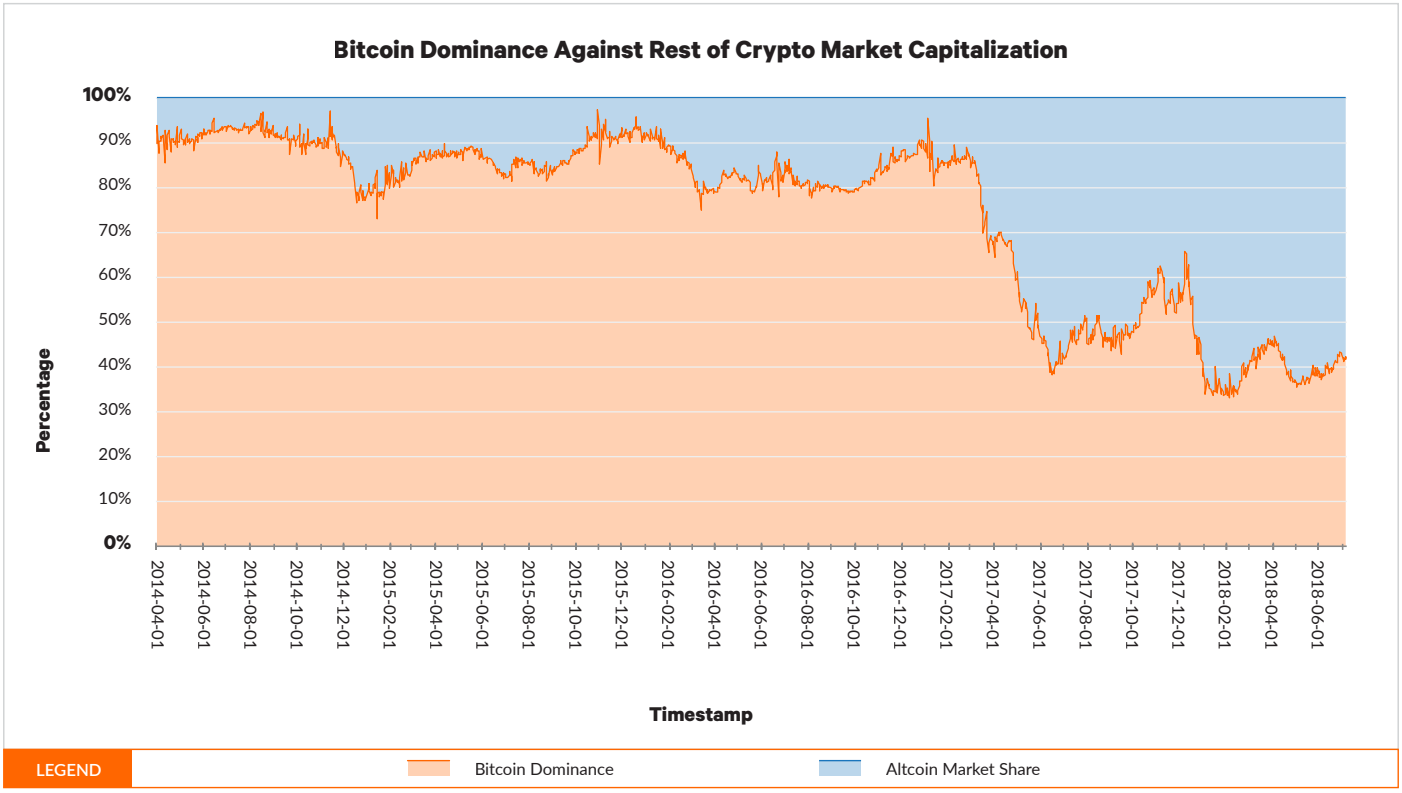
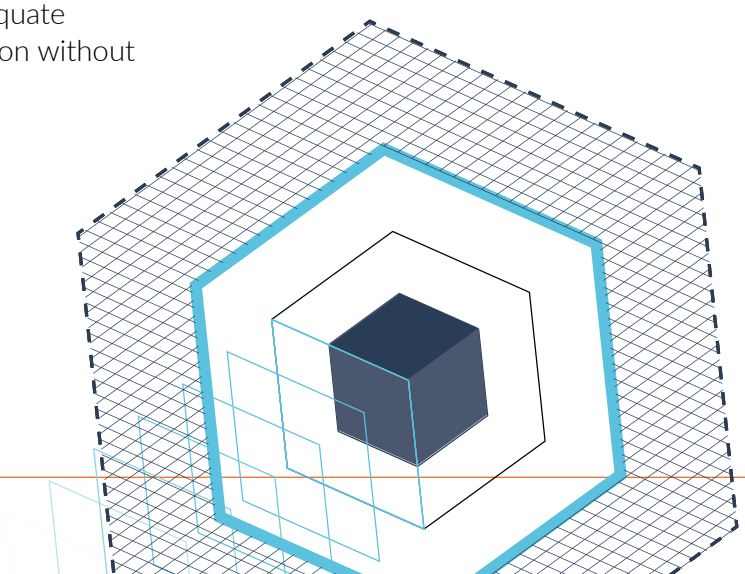


Figure 3

Just as different regulatory and judicial rulings on bitcoin have depended on a specific court assessing the case brought to it, and the purpose of the dispute, ecosystem stakeholders will eventually have to discuss the regulatory and judicial status of cryptographic assets with more complex economic properties. That is, crypto assets that can simultaneously serve as all three traditional asset classes.

While cryptographic assets with full and partial capital asset properties can represent an attractive opportunity for investors due to their passive income features, we expect this subset of crypto assets to receive increasing regulatory attention as their market share of total capitalization increases and policy makers start evaluating adequate measures to ensure consumer protection without hindering innovation.

Figure 3 above shows a time series of Bitcoin's dominance against the rest of the crypto market capitalization. We expect the subset of crypto assets with full and partial capital asset properties to follow similar market dynamics as Bitcoin's dominance up to 2017, i.e. observe a market phase of extended accumulation followed by a rapid market capitalization increase relative to crypto assets with no capital asset properties.



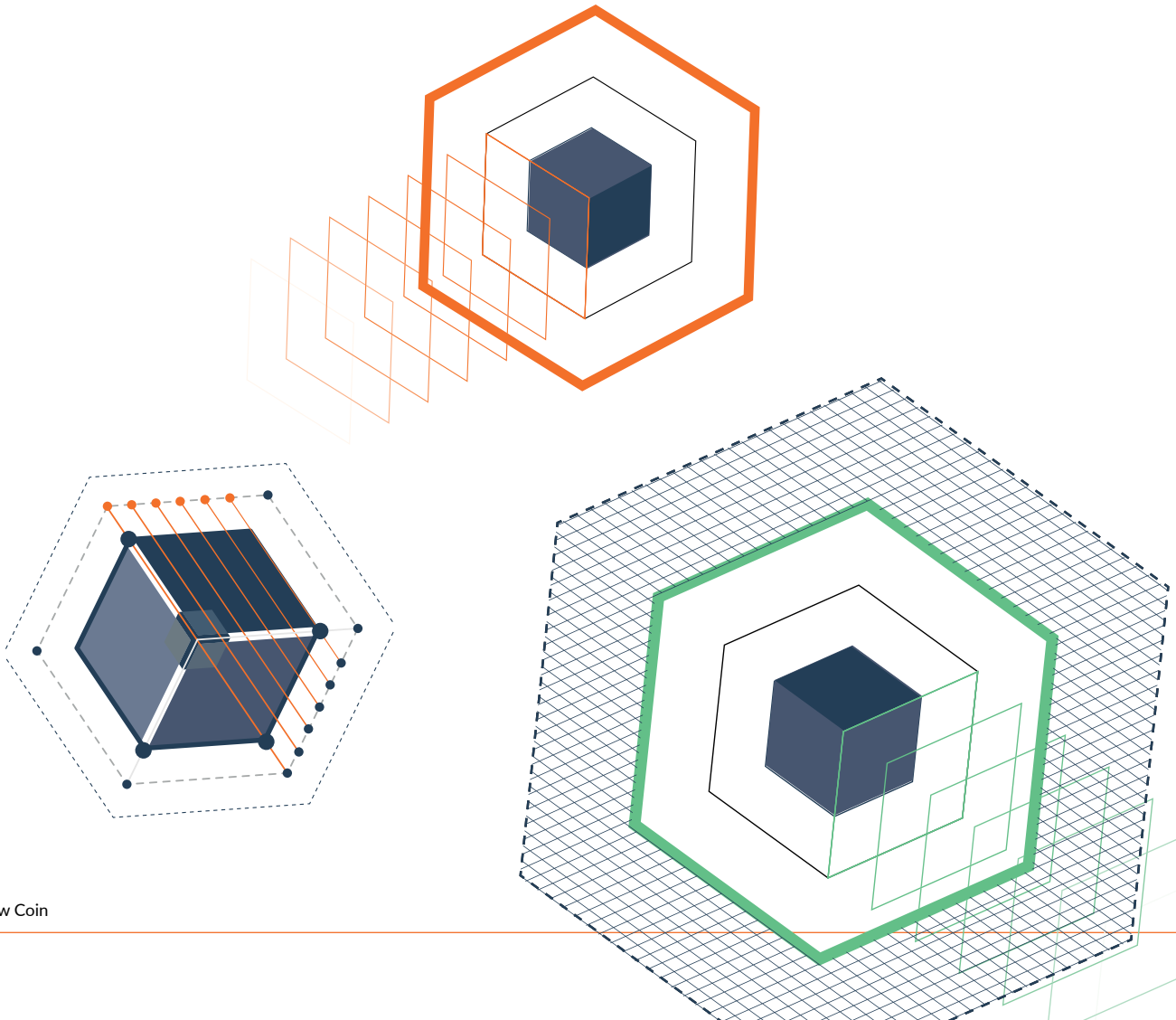
Section IV:
Closing remarks

This use case article discussed two broad topics. Firstly, why some cryptographic assets should be considered able to perform the basic functions of money. Namely, because the usual objections of low transaction capacity/speed, poor security, ease of use, low liquidity, and high volatility are either misplaced, or soon to be obsolete.

Second, this use case article not only argued that bitcoin is both a currency and a commodity, but also that some cryptographic assets, those which provide a periodic revenue stream through Masternodes or staking features, can simultaneously behave as all three traditional superclasses of assets (i.e. capital asset, commodity, and store of value).

The third section of this article showed how users, mainly government agencies and regulatory bodies, can use the API of the General Taxonomy of Cryptographic Assets to identify and study the economic properties of these assets. It's worth noting however that this API can be consumed by any market participant, either to better inform their policy decisions, investment process, or development approach.

Over the coming months we will continue to publish use case articles focusing on how different users can incorporate GTCA's API to their workflow and production pipeline.



References

BitMEX Research. 2017. "Bitcoin Economics – Credit expansion and the characteristics of money (Part 2)." *BitMEX*. Available online at: https://blog.bitmex.com/bitcoin-economics-credit-expansion-part-2/

Boyapati, Vijay. 2018. "The Bullish Case for Bitcoin". *Medium*. Available online at: https://medium.com/@vijayboyapati/the-bullish-case-for-bitcoin-6ecc8bdecc1

Buell, Todd. 2017. "Bitcoin's an asset, not currency: ECB's Constancio." *Market Watch*. Available online at: https://www.marketwatch.com/story/bitcoins-an-asset-not-currency-ecbs-constancio-2017-11-29

Coinbase. 2018. "Coinbase's written testimony for the Subcommittee on Capital Markets, Securities, and Investment". *Medium*. Available online at: https://blog.coinbase.com/coinbases-written-testimony-for-the-subcommittee-on-capital-markets-securities-and-investment-47f8a260ce41

Dorfman, Jeffrey. 2017. "Bitcoin Is An Asset, Not A Currency". *Forbes*. Available online at: https://www.forbes.com/sites/jeffreydorfman/2017/05/17/bitcoin-is-an-asset-not-a-currency/#1ce6ad062e5b

Emsley, Jonnie. 2018. "Pantera CEO Thinks Crypto Market Could Reach $40 Trillion, Calls Bitcoin 'Screaming Buy'." *Cryptoslate*. https://cryptoslate.com/pantera-ceo-thinks-crypto-market-could-reach-40-trillion-calls-bitcoin-screaming-buy/

Federal Reserve Bank of New York. 2018. "Foreign Reserves Management." *Federal Reserve Bank of New York*. Available online at: https://www.newyorkfed.org/markets/international-market-operations/foreign-reserves-management

Hacked. 2018. "What are the Chances of a Trillion-Dollar Crypto Market Emerging This Year?". *Hacked*. Available online at: https://hacked.com/1-trillion-crypto-market-evaluating-the-chances/

Katz, Lily. 2018. "Bitcoin Bull Tom Lee Goes Hyperbolic on Latest Price Forecast." *Bloomberg*. Available online at: https://www.bloomberg.com/news/articles/2018-01-18/bitcoin-bull-tom-lee-goes-hyperbolic-on-latest-price-forecast

Krugman, Paul. "Golden Cyberfetters". *New York Times*. Available online at: https://krugman.blogs.nytimes.com/2011/09/07/golden-cyberfetters/

The Economist. 2014a. "Money from nothing." *The Economist*. Available online at: https://www.economist.com/finance-and-economics/2014/03/15/money-from-nothing

The Economist. 2014b. "Bitcoin's deflation problem." *The Economist*. Available online at: https://www.economist.com/free-exchange/2014/04/03/bitcoins-deflation-problem

European Central Bank. 2018. "Foreign reserves and own funds." *European Central Bank*. Available online at: https://www.ecb.europa.eu/ecb/tasks/reserves/html/index.en.html

Internet World Stats. 2018. "Internet Growth Statistics." *Internet World Stats*. Available online at: https://www.internetworldstats.com/emarketing.htm

Nakamoto, Satoshi. 2009. "Bitcoin: A Peer-to-Peer Electronic Cash System." *Bitcoin.org*. Available online at: https://bitcoin.org/bitcoin.pdf

Needham. 2016. "Bitcoin Adoption Growing & Fundamentals Improving; Raising Price Projection." *Needham*. Available online at: https://needham.bluematrix.com/sellside/EmailDocViewer?encrypt=f33e2e42-a64c-49c4-ae1a-bfc513744823&mime=pdf

Only Gold. 2018. "What is the value of all the Gold in the world?". *Only Gold*. Available online at: http://onlygold.com/Info/All-The-Gold-In-The-World.asp

Royse, Roger. 2013. "FinCEN issues guidance on Bitcoin and virtual currency." *R Royse Law*. Available online at: https://rroyselaw.com/technology-transactions/cryptocurrency/fincen-issues-guidance-on-bitcoin-and-virtual-currency/

Russo, Camila. 2018. "ETF Veteran Goes Crypto, Predicting Multitrillion-Dollar Market." *Bloomberg*. Available online at: https://www.bloomberg.com/news/articles/2018-02-20/etf-veteran-goes-crypto-predicting-multitrillion-dollar-market

Shieber, Jonathan. 2014. "Goldman Sachs: Bitcoin Is Not A Currency". *TechCrunch*. Available online at: https://techcrunch.com/2014/03/12/goldman-sachs-bitcoin-is-not-a-currency/

Uetake, Tomo, and Hideyuki Sano. 2017. "CME's Melamed sees bitcoin becoming new asset class." *Reuters*. Available online at: https://www.reuters.com/article/us-cme-group-bitcoin/cmes-melamed-sees-bitcoin-becoming-new-asset-class-idUSKBN1D712M

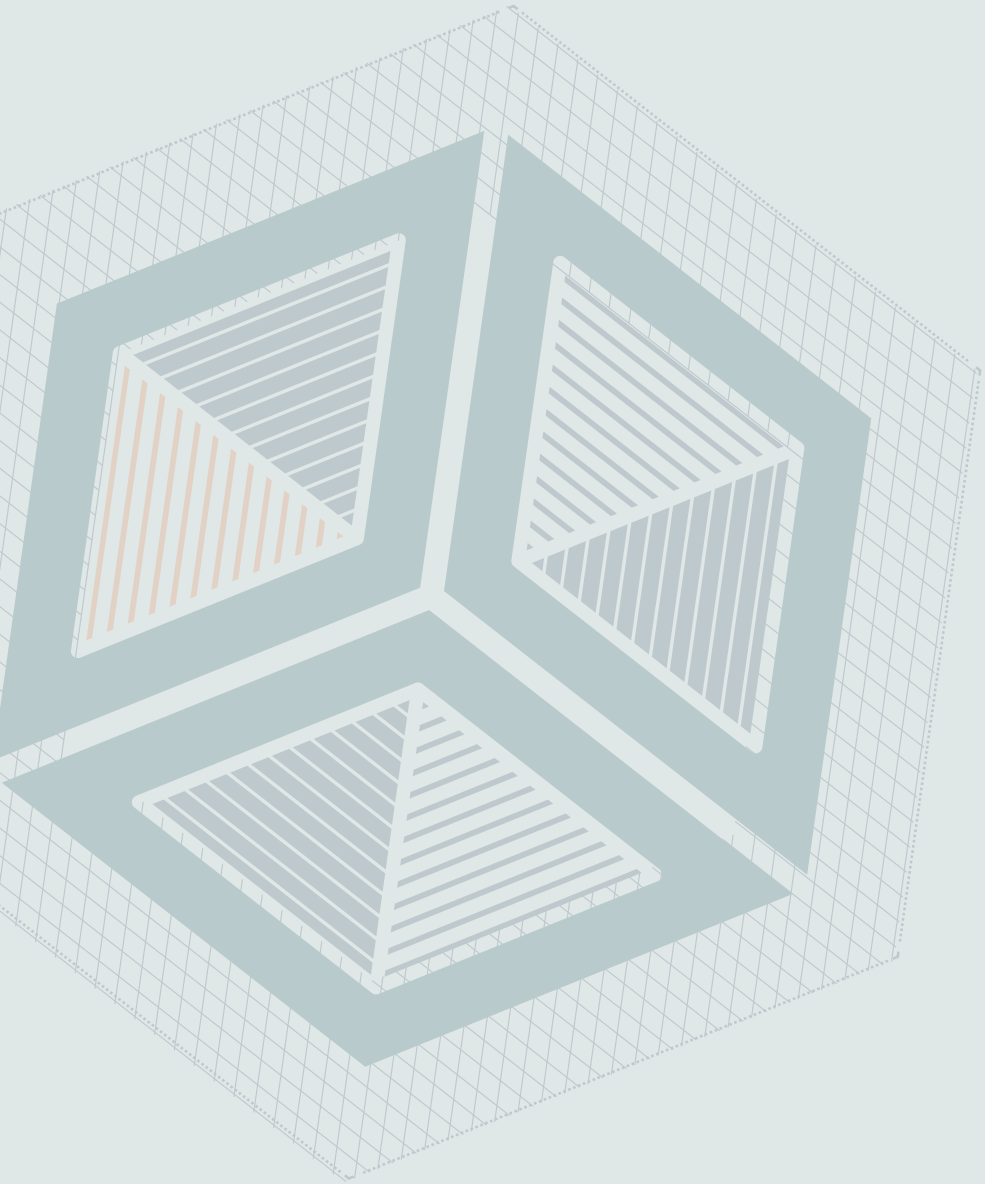
The Underground Economist. 2011. "Why Bitcoin can't be a currency". *The Underground Economist*. https://undergroundeconomist.com/post/1528511369

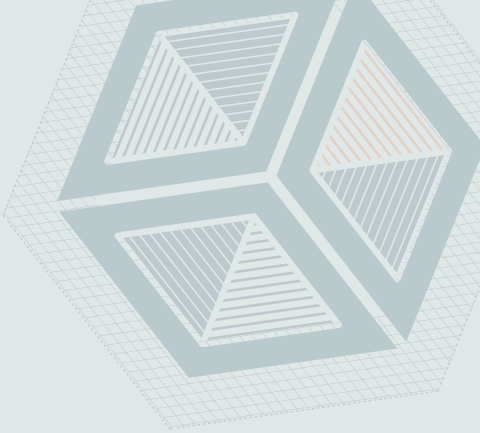
U.S. CFTC. 2015. "CFTC Orders Bitcoin Options Trading Platform Operator and its CEO to Cease Illegally Offering Bitcoin Options and to Cease Operating a Facility for Trading or Processing of Swaps without Registering." *U.S. Commodity Futures Trading Commission*. Available online at: https://www.cftc.gov/PressRoom/PressReleases/pr7231-15

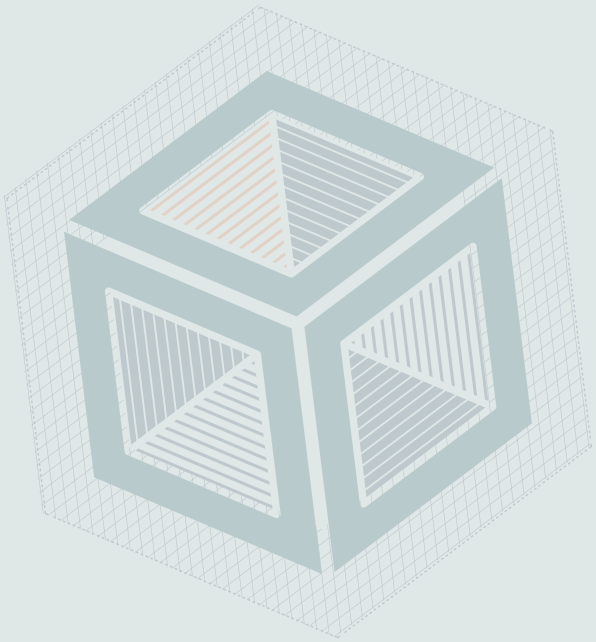
U.S. CFTC. 2018. "Remarks of Commissioner Rostin Behnam at the BFI Summit 'Fostering Open, Transparent, Competitive, and Financially Sound Markets' United Nations Plaza New York, NY." *U.S. Commodity Futures Trading Commission*. Available online at: https://www.cftc.gov/PressRoom/SpeechesTestimony/opabehnam7

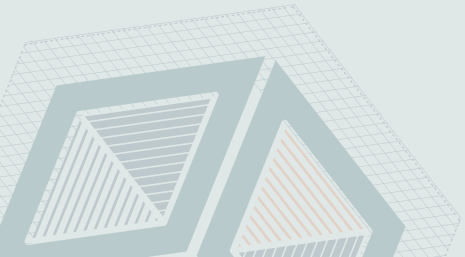
World Gold Council. 2018. "Gold ETFs and similar". *World Gold Council*. Available online at: https://www.gold.org/data/gold-etf-holdings

Yermack, David. 2014. "Bitcoin Lacks the Properties of a Real Currency." *MIT Technology Review*. Available online at: https://www.technologyreview.com/s/524666/bitcoin-lacks-the-properties-of-a-real-currency/









Taxonomy

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