Bitcoin Revisited

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A two month bitcoin rally has reignited the gold-versus-bitcoin debate. We view such either-or comparisons of gold and bitcoin as somewhat specious, because we see little commonality between the two assets. Gold continues to function as a reliable store of value and productive portfolio-diversifying asset. In contrast, bitcoin continues to augment its reputation as a highly erratic speculation. To the degree investors may seek exposure to speculative assets, bitcoin can certainly play a role in a wide range of investment portfolios. It goes without saying, however, that bitcoin's investment merits, **at least to date**, have proven distinctly different from gold's portfolio utility.

We last updated our bitcoin views in July 2017. At the time, we identified six comparative investment attributes which we felt established gold as clearly superior to bitcoin as a portfolio store of value. The six differentiating categories were: **infancy, scale, immutability, volatility, safety, and trust**. Now, some two years after writing that report, our confidence in gold as preferred store of value has only increased.

We recognize that fervency among bitcoin supporters remains unflinching. We maintain high regard for bitcoin enthusiasm because it emanates from the same philosophical impulses motivating gold investors. At the risk of oversimplifying, owners of gold and bitcoin share many of the same concerns. **Gross monetary mismanagement by global central banks has destroyed the capacity for fiat currency to serve as a stable unit of account**.

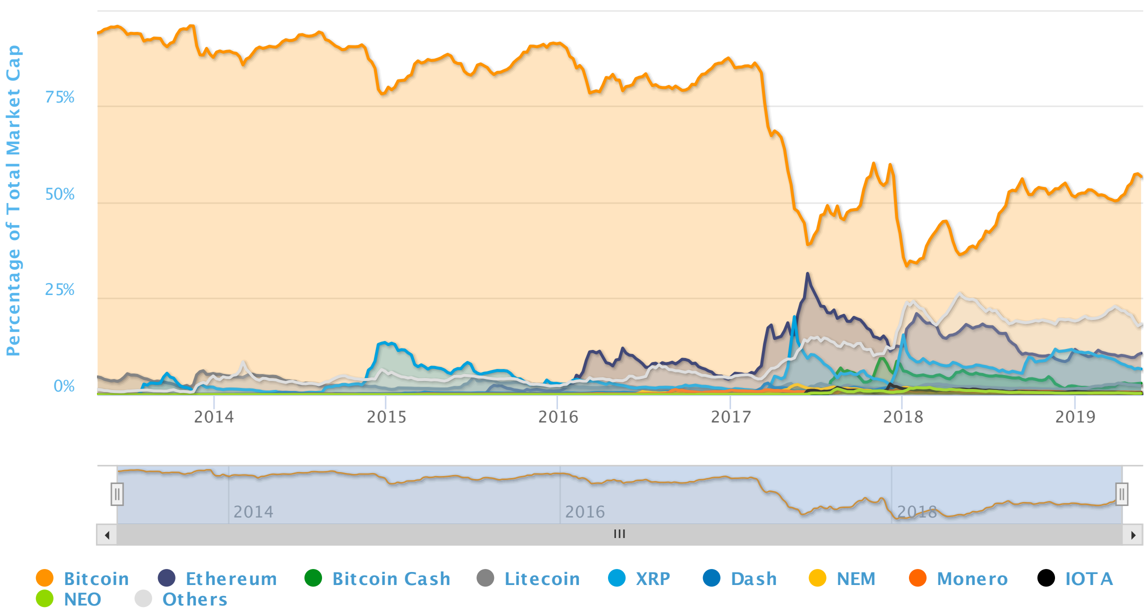
In essence, gold and bitcoin function as divergent paths to the common goal of protecting capital from rampant monetary debasement. To us, however, similarities between gold and bitcoin end with this shared investment objective. From there, **differences** between gold and bitcoin become diametric. In this report, we provide brief updates to our six key differentials between gold and bitcoin as productive portfolio assets. Subsequently, we provide our perspective on three recent developments in the cryptocurrency world.

Infancy

In our July 2017 report, *Why Cryptocurrencies (Bitcoin) are Unlikely to Usurp the Role of Gold*, we suggested that a developing rush of competing cryptocurrencies made it a bit early to declare bitcoin the ultimate winner in the crypto derby. Just as Netscape had once been the undisputed market-leading browser in an emerging technology called the internet, bitcoin had (thus far) been the undisputed market-leading crypto in an emerging technology called the blockchain. In the intervening two years, however, it has become clear that bitcoin has consolidated its overwhelming significance in the crypto category. To us, bitcoin is really the only cryptocurrency that matters.

By way of example, when we published our 7/15/17 report, CoinMarketCap reported that bitcoin's market cap represented **46%** of the total crypto universe, composed of 973 cryptocurrencies and tokens. By 5/21/19, CoinMarketCap was tracking **2,194 different cryptos** (an increase of 125%), yet, as shown in Figure 1, bitcoin's total market share had **increased to 57%**. Indeed, CoinMarketCap's individual price graphs for all 2,194 cryptos display two separate lines: one pricing the crypto in U.S. dollars and the other pricing the crypto in bitcoin[1].

Figure 1: Total Cryptocurrency Market Share of Ten Leading Cryptocurrencies
(4/28/13-5/24/19)



Source: CoinMarketCap.com.

Since the original explosion in crypto offerings in late-2017, the vast majority of cryptocurrencies and tokens have been exposed as fraud, folly or less. During the same span, the majority of crypto talent and innovation has funneled towards developing bitcoin infrastructure and applications. Critical to blockchain disciples, for example, bitcoin is the **only** crypto network based on truly decentralized architecture. Indeed, while we cannot comment on all 2,194 cryptos, our due diligence confirms that among the top-10 cryptos (86.8% of total crypto market cap) **only** bitcoin is truly decentralized—the other nine products have sponsors with disqualifying control or influence.

Scale

In our 7/15/17 report, we somewhat naively reported that total bitcoin in circulation numbered **roughly** 16.5 million units. Since that date, the global bitcoin computer network has been minting exactly 12.5 new bitcoin **every 10 minutes**. Therefore, the total number of bitcoin in circulation by 7:00 pm EST on 5/21/19 had increased to 17,714,350 (we have learned to be precise when quoting bitcoin statistics). At $7,974.81 per bitcoin pop, this meant that total bitcoin market cap at 7:00 pm on 5/21/19 measured $141,268,585,882. While any asset measuring $141 billion is nothing to sneeze at, we do find it a bit of a head-scratcher as to why such a tiny amount of dedicated global capital receives such widespread attention. After all, there are individual hedge funds of comparable size to bitcoin's entire market cap!

Further, the negligible amount of global capital engaged in bitcoin trading circulates at breathtaking velocity. For example, during the 24 hours prior to our 7:00 pm 5/21/19 snapshot (described in above text), bitcoin trading volume measured 3,182,475 units, or **18%** of all existing bitcoin. In other words, the bitcoin stock now trades at a rate equivalent to **100% turnover every 5½ days!** With all due respect, how does such a tiny, hyper-traded asset even garner **consideration** as a store of value?

While gold market statistics can never compare with the precise mathematics of blockchain algorithms, we would observe that bitcoin's $141 billion market-cap at 7:00 pm on 5/21/19 measured a minuscule **1.7%** of the **$7.93 trillion** value of the 193,472-tonne above-ground gold stock as measured by the World Gold Council "WGC" (1/31/19). Point being, while bitcoin may represent an alluring speculation for temerarious **individual** investors, it is hard to fathom how its comparatively inconsequential market-cap will compete with gold on an **aggregate** scale anytime in the foreseeable future. We simply don't buy the argument that revaluing bitcoin by adding a few zeroes to its dollar price will accomplish the trick of significance. Indeed, despite consistent anecdotes of imminent institutional gearing, we have yet to encounter significant testimonial from high-net-worth investors on bitcoin's behalf (from high profile bitcoin promoters: absolutely; from significant investors: not so much).

An oft-cited allure of bitcoin is its hard cap at 21 million units. The argument goes that this hard cap makes bitcoin even more precious than gold. Well, it is interesting to note that the current rate of bitcoin mining dilution runs **over 100% higher** than the current rate of gold mining dilution. The current annual bitcoin mining rate of 657,000 units represented **3.85%** dilution of the existing bitcoin stock during the past twelve months. In contrast, WGC estimates that global gold mine production diluted the above ground gold stock at less than **half** that pace during the prior year. Gold miners harvested 3,502.8 tonnes of new supply during 2018, or only **1.84%** of the 189,969 tonnes of above-ground supply.

In the interests of full disclosure, crypto aficionados attribute bitcoin's recent rally at least in part to an anticipated "halving" event anticipated on May 22, 2020. At some hour on that future date, the algorithms controlling creation of new bitcoin are scheduled to cut the rate of issuance **in half** to 6¼ bitcoin for each of the next 210,000 bitcoin blocks—one every 10 minutes—for the following four years (until May 2024). This means that for four years beginning May 2020, the limits of mathematics will be diluting the existing bitcoin stock at **exactly the same rate** that the rules of nature will be diluting the above-ground gold stock. To bitcoin pros we pose the question, "Is halving every **four years** really a tradeable event?"

Immutability

No category of gold-bitcoin comparison resembles a Rorschach ink blot more than relative perceptions of immutability. From the gold perspective, for over 5,000 years, an ounce of gold has been exactly the same: an ounce of gold. There are no variations or imitations. Central banks hold gold because of its extraordinary density and rarity. There is no society on earth which does not regard gold as valuably precious. Gold is virtually indestructible. Gold never tarnishes. Gold is immutable.

Bitcoin, in comparison, is a string of code generated by software protocols and cryptographic algorithms. While a sophisticated programmer might take comfort in transparency of the blockchain ledger, this type of intellectual security eludes many investors outside the Bay area and lower Manhattan. For most investors, bitcoin is shrouded in a dense cloak of ambiguity because underlying protocols are unknowable.

In short, our views of comparative immutability between gold and bitcoin have not changed one iota since our July 2017 report. We can't help but wonder what happens to bitcoin when the power goes out!

Volatility

We provide below, for collective consideration, a comprehensive synopsis of bitcoin's **entire trading history**.

Legend and ledger suggest Satoshi Nakamoto mined the original "genesis" block of 50 bitcoin at 18:15:05 (GMT) on 1/3/09. On 1/12/09 the first bitcoin transaction (block #170) occurred from Satoshi Nakamoto to Hal Finney. On 10/5/09, the first dollar exchange value for bitcoin was published at $1 = 1,309.03 bitcoin ($0.00076). On 5/22/10 (with bitcoin valued at $0.0025), Laszlo Hanyecz conducted the first online bitcoin purchase: a Papa John's pizza for $25.00 (10,000 bitcoin now worth roughly $80 million). Between 7/12/10 and 11/6/10, quoted bitcoin prices rose from $0.008 to $0.50, and by 12/31/2012 reached $13.51.

During November 2013, bitcoin surged 446%, from $208.18 on 11/1/13 to $1137.00 on 11/29/13, before declining 86% to $160.37 by 1/14/15. Bitcoin finally regained the $1,000-level on 1/2/17, and first traded higher than one ounce of spot gold[2] on 3/2/17 (intra-day high of $1,292.61). From there, bitcoin surged to its all-time high of $19,511.00 on 12/18/17, before declining 84% to a 12/14/18 low of $3,136.04. In the current trading chapter, bitcoin has surged to a 5/16/19 high of $8,386.13. It is obviously anyone's guess where bitcoin heads from here.

In contrast, since bitcoin first exceeded the spot gold price on 3/2/17, the entire trading range for spot gold has been between $1,160.27 (8/16/18) and $1,366.18 (1/25/18), or a 17.7% range as measured from the low.

As investors contemplate gold and bitcoin as alternate options for portfolio store-of-value, we will simply let the above statistics speak for themselves.

Safety

For thousands of years, no asset has been more alluring for plunder or theft than gold. Consequently, modern society has developed lots of dependably safe options for owning and storing bullion. On the bitcoin side of the ledger, while significant progress has been made in safekeeping (cold-storage wallets, etc.), treacherous vulnerabilities still remain along the "last 10 yards" of interaction with even the largest and most sophisticated crypto exchanges. On 1/29/19, U.S.-based cyber security firm CipherTrace published a report outlining $1.7 billion in publically disclosed 2018 cryptocurrency scams and thefts, including $950 million in thefts from crypto exchanges and wallets (up 257% from $266 million in 2017) and $725 million from exit scams such as fraudulent initial coin offerings and phony exchanges (up 1200% from $56 million in 2017). CipherTrace CEO Dave Jevans commented,

> "These numbers only represent the loot from crypto crimes that CipherTrace can validate; we have little doubt that the true number of crypto asset losses is much larger."

Sure enough, CipherTrace reported on 4/30/19 that crypto losses soared to $1.2 billion during the **first quarter** of 2019, including an $851 million fraud at major crypto exchange Bitfinex, $195 million in fresh exit scams and $154 million in thefts from exchanges and wallets.

Finally, on 5/8/19 it became patently clear that no crypto institution is immune from hacking when the world's largest crypto exchange, Hong Kong-based Binance, reported theft of 7,000 bitcoin ($41 million) from the exchange's hot wallet in a single phishing transaction. Binance CEO Changpeng Zhao lamented that the hacker's withdrawal slipped by the exchange's security protocols because it was perpetrated "at the most opportune time," and was structured in such a manner that it "passed our existing security checks."

In our view, the crypto world still has lots of work to do in the safekeeping department.

Trust

Marc Andreessen has suggested that the truly disruptive breakthrough of bitcoin is that its technology enables a "distributed network of trust." In essence, the blockchain ledger substitutes for knowledge of counterparties. Unfortunately, the blockchain establishes this trust by recertifying all prior transactions in every new transaction by way of an inordinately costly process called "proof of work." Consequently, blockchains will always be subject to the "blockchain trilemma," which asserts that it is impossible for any ledger to satisfy the three countervailing aims of correctness, decentralization and cost efficiency.

By way of example, the bitcoin blockchain is already so unwieldy that in order for the bitcoin computer network to self-fund the cost of processing each incremental block, it now must create and award 12.5 bitcoin every 10 minutes to motivate the competing processors. In other words, in order to defray the cost of maintaining bitcoin's "proof of work" ledger, the bitcoin network must **create out of thin air roughly $100,000 worth of new bitcoin every 10 minutes**. When bitcoin hits its 21 million unit hard cap, where is the capital going to come from to power the gargantuan power needs of the bitcoin computer network?

A Trio of Recent Crypto Developments

1. With respect to the performance of gold versus bitcoin as portfolio store of value, we find relevance in examining the comparative performance of both assets during Q4 2018 equity-market turbulence. Between Chair Powell's "long way from neutral comment" on 10/3/18 and Secretary Mnuchin's convening of the President's Working Group on Financial Markets on Christmas Eve, the S&P 500 Index[3] declined 19.6%. Over the same span, spot gold rose 6.0% (from $1,197.35 to $1,269.13), and the NYSE Arca Gold Miners Index rose 11.7%. In comparison, **bitcoin declined 36.9%** (from $6,438.41 to $4,063.94). This type of relative performance during a period of pronounced market stress only reaffirms our suspicion that bitcoin, at least to date, functions more like a speculative asset than a *bona fide* store of value.

2. On 5/13/19, Flexa launched a new crypto payment network allowing customers to spend cryptocurrencies in physical stores. In essence, shoppers use Flexa's "SPEDN" app to generate a QR code to scan for items at checkout registers. The merchant receives immediate payment in dollars, and the equivalent amount of cryptocurrency is debited from the customer's cryptocurrency wallet in the SPEDN app. The breakthrough here is that merchants have been hesitant to accept cryptos directly because doing so exposes them to crypto price volatility and slow blockchain transaction speeds. Joining the rollout fanfare were participating merchants GameStop, Nordstrom, Whole Foods, Caribou Coffee, Jamba Juice and Crate & Barrel. After all, the merchants receive dollars and have no further crypto headache.

   While this all sounds pretty cool, Flexa neglected to highlight during its SPEDN launch that purchasing a Jamba Juice smoothie for $7.95 will create an independent sale tax lot of $7.95 worth of bitcoin for the smoothie purchaser. Because the IRS classifies all cryptocurrencies as property, this $7.95 sale lot will need to be matched against an offsetting bitcoin purchase lot (with complete price-and-date cost information) and reported on Schedule D to Form 1040 on the smoothie purchaser's federal tax returns.

   Indeed, **every** crypto sale lot for Jamba Juice smoothies, GameStop video games, and Crate & Barrel cutlery **must** be matched against a crypto purchase lot, and should that specific lot have been purchased fewer than 12 months prior to the product purchase, any gain on the liquidated crypto would be taxed as ordinary income by the IRS. For successful crypto investors, this can amount to quite the expensive smoothie! The good news for health nuts, gamers and aspirational home outfitters is that gains on crypto sales to purchase such items are eligible for long-term capital gain tax treatment if the prior crypto holding period exceeded one year. As long as one employs a fulltime accountant, Flexa's SPEDN app serves as an exciting example of digital progress enhancing societal productivity!

3. In early May, Grayscale, the world's self-proclaimed "largest digital currency asset manager" launched an edgy 40-second video entitled "Drop Gold." https://dropgold.com/ In the video, two sharply dressed millennials, apparently on an epiphany-related adrenalin rush, gallop through a Wall Street stage-set of pinstriped elders struggling to push gold bars around in shopping carts, hand trucks and, yes, even chains. The ad's acerbic narrative runs,

   > "Why did you invest in gold? Are you living in the past? In a digital world, gold shouldn't weigh down your portfolio. You see where things are going. Digital currencies like bitcoin **are** the future. They're secure, borderless, and unlike gold, they actually have utility. Leave the pack behind. It's time to drop gold. Go digital. Go Grayscale."

First of all, we have always been fascinated by crypto promoters' obsession with gold. After all, bitcoin is nothing but a cryptographic algorithm, and Satoshi left no instructions as to how bitcoin should be visually portrayed. As far as bitcoin is concerned, thumbtacks would suffice. Yet, bitcoin **purveyors** overwhelmingly embrace versions of the image in Figure 2, best described as a one-ounce gold coin with a nifty bitcoin-type dollar sign superimposed at the coin's center. **How provocative!**

Figure 2: Representative Bitcoin Depiction (5/17/19)

Source: Cryptoline News.

Second, the derogatory depiction of gold in the Grayscale video belies to us a bit of a Freudian complex. After all, why would images of downtrodden and shackled gold owners ever be needed to motivate intelligent investors to embrace the forward-looking digital freedom of Grayscale? Well, one reason might be that shares of the Grayscale Bitcoin Trust have traded at an **average 48% premium** to the underlying value of the Trust's bitcoin holdings during the past two years. Wow! In the contemporary environment of fee compression, glossing over a 48% premium to underlying NAV is certainly a challenge fit for Madison Avenue creativity.

Let's flip our Grayscale interrogative on its head. Why would investors **routinely** pay a 48% premium to purchase the same fungible bitcoin available on free cellphone apps on a 24/7 basis from roughly 130 bitcoin exchanges? **The answer is that serious investors remain petrified by the prospect of bitcoin theft or loss**. On top of the prevalent security threats we have outlined above, there are legions of examples of investors losing their bitcoin simply because they misplaced or forgot their bitcoin ownership keys. When this occurs, the bitcoin are lost forever.

It turns out that a primary reason investors pay a 48% premium to own their bitcoin with Grayscale is that the firm outsources storage of all of its investors' bitcoin to Xapo, an infamously secretive Hong Kong-based crypto custodian priced far beyond the reach of the average individual investor. Xapo's CEO, Argentinian entrepreneur Wences Casares, observes,

> "We've built a fortress. Secure bitcoin storage is what we do best. We've developed a new standard in bitcoin security that protects your assets by using man, machine and even a mountain to keep your money safe."

The central challenge to bitcoin storage is protecting the owners' private, cryptographic keys (which form a pair with particular, public-facing keys on the bitcoin network to provide access to the owners' bitcoin). These private keys must be digitally stored off line (so they can't be hacked), in a secured setting (so they can't be physically stolen), and ensconced in a Faraday-type enclosure (immune to electromagnetic impulses which might wipe stored code away). To begin with, Xapo divides every bitcoin owner's digital private keys equally amongst at least three different vaults on three different continents. As shown in Figure 3, the Xapo vault on the European continent is located inside a decommissioned Swiss military bunker dug into a granite mountain near Attinghausen, Switzerland.

Figure 3: Xapo's European Continent Bitcoin Vault, Attinghausen, Switzerland (10/17/17)

Source: Quartz Media.

Joon Ian Wong, a journalist from Quartz Media and one of the few human beings ever permitted to view Xapo's Swiss bunker, published the following description 10/17/17:

> "The entrance to the vault is located at the end of a single-lane road at the foot of a mountain, blocked by a 10-foot steel fence. The bunker's concrete door leads into a lobby where prospective visitors are fingerprinted and photographed before entering a bulletproof glass case, which is opened on the other side by a security professional.
>
> An ID card check later, and a visitor must then pass through a set of steel revolving doors into the bowels of the mountain. At the end of a 300-foot passageway are a pair of nuclear-grade blast doors. A second glass cage awaits, followed by a white door that leads to a cooling unit and a second door that even visitors are not allowed to access. Past that door is the vault's operations room and the cold room where storage of client's private keys actually takes place. The cold room is surrounding by a steel plate Faraday cage to guard against electromagnetic attacks.

> The cold room can't actually be entered; it's sealed with tape to prevent tampering. Operators interact with the offline servers beyond via cables running into the cold room. Those operators have their actions checked by independent operators at two other Xapo vaults, which must be located on two separate continents.
>
> All told, it takes about two days to withdraw a client's bitcoin from storage."

All we can say is that if this is the security Grayscale deems necessary to protect its clients' bitcoin, it certainly makes the firm's "Drop Gold" campaign disturbingly disingenuous! A far more honest appeal to gold investors might have been, "Drop your shopping carts, hand trucks and chains and join us in the digital freedom of an abandoned military bunker!"

Our polite response to the Grayscale parody is best summarized, "Different strokes for different folks!"

Sincerely,

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[1] Bitcoin prices quoted are the Bloomberg Bitcoin Currency Index (XBT), which aggregates trading from the following bitcoin exchanges: Bitfinex, Bitflyer, Bitstamp, CEX.IO, Coinbase, EXMO, Independent Reserve, ItBit and Kraken.

[2] Spot gold is measured by the Bloomberg GOLDS Comdty sub-index.

[3] S&P 500® Index represents 505 stocks issued by 500 large companies with market capitalizations of at least $6.1 billion. This Index is viewed as a leading indicator of U.S. equities and a reflection of the performance of the large-cap universe. The SPX Index represents price only, and SPXT Index represents total return with dividends reinvested.

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