Cryptocurrency Basics:
From An Investor Perspective

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Cryptocurrencies have become one of the trendiest investment topics over the past few years, and perhaps for good reason. Investors, traditional media, and social media have discussed and debated the validity of these instruments, and specifically whether they are to be viewed as equal to more traditional methods of investment securities such as stocks or bonds, or whether they are merely a tool for speculators.

All the while, the world of cryptocurrency (crypto) has become more complex and sophisticated since the introduction of Bitcoin (BTC). This too has generated substantial attention among the masses. In fact, a large number of (alternative) cryptocurrency coins have since been developed and traded, and non-fungible tokens (NFTs) have come on the scene as well. These digital vehicles allow investors to buy and sell assets that exist in the real world – such as artwork or even real estate. Evolutions such as, Decentralized Finance (DeFi), a financial technology and the creation of the Metaverse have only further helped to drive the discussion of and allure in this space.[1]

The Nuts and Bolts of Cryptocurrencies

Cryptocurrencies are digital or virtual currencies that can be transferred online by using public-key cryptography and blockchain technology, which is simply a distributed ledger enforced by a disparate network of computers to record the transfer.[2] There are, at this point, thousands of coins available, but it is a bifurcated market with the top ten coins accounting for more than 80% of the total market capitalization, per Bitwise Asset Management's "Crypto 201" presentation. What might surprise some readers is that cryptocurrency is actually held more widely than expected. A 2021 Institutional Investor Digital Assets Study found that in the U.S., 33% of surveyed investors held digital assets. Many are asking themselves, "Should I be investing in this too?" particularly given the advent of new coins and the significant run-up in prices crypto has seen in recent years.

Is this a Viable Investment Opportunity?

In order to determine the case for or against investing in "crypto," one must first have defined the asset itself to understand the potential risk and reward. In this piece, we will highlight various aspects of cryptocurrencies but will also hone in with greater detail on Bitcoin, since it is arguably the most well-known coin in this marketplace. Further, we will evaluate Bitcoin in relation to other assets/indices to answer the questions of "What is crypto?", "What are the correlations, if any, with more traditional and widely held investment vehicles?" and "How might the digital currency fit in one's portfolio?"

1 The metaverse is a digital reality that combines aspects of social media, online gaming, augmented reality (AR), virtual reality (VR), and cryptocurrencies to allow users to interact virtually. https://www.investopedia.com/metaverse-definition-5206578.

2 Cryptocurrencies may or may not be considered 'securities' for regulatory purposes. https://www.bloomberg.com/news/articles/2022-07-29/why-crypto-flinches-when-sec-calls-coins-securities-quicktake.

What it is and What it's not…

While there are a lot of things we do not know about this marketplace, we can use other more well-known assets as a proxy to help define the initial parameters of this market. At a basic level, based upon the readily available information, we know what it is as opposed to what it is not:

What It Is	What It's Not
Value is determined by the marketplace	No intrinsic value or underlying asset (as might be seen with commodities such as gold)
Digital currency	No physical form, not accepted as currency by all vendors
Supply is determined by the coin inventor	There is no Central Bank or any other entity that dictates supply

From what we have observed, investors have been attracted to cryptocurrencies primarily because:

- There is a historically low correlation to risk assets
- Cryptocurrencies such as Bitcoin and Ethereum have had periods of strong historical returns
- Fear of missing out (FOMO) is a motivator for others
- Curiosity plays a role for some
- The new underlying technology and investment opportunities that can potentially emerge from this space are yet another allure

Bitcoin and its Origins

As mentioned, the genesis of cryptocurrencies began with Bitcoin, which was first introduced in 2008 in a whitepaper by Satoshi Nakamoto. He saw Bitcoin as a novel way to transfer value over the internet without any one person or entity having absolute control over the vehicle. A significant advantage is that it is a currency that settles almost instantly because of the underlying blockchain infrastructure, which can be an advantage when compared with more traditional means of investment.

How might Bitcoin, considered the widely held cryptocurrency, fit into a traditional asset allocation?

When constructing portfolios, investors endeavor to combine asset classes and exposures based on their correlations to each other in order to provide a level of diversification.

For our research (figuring out/defining what Bitcoin is and potential correlations), we compared price movements between it and well-known indices to gain an understanding of potential correlation. The results of this are below:

Correlation with Bitcoin	6 Months	1 year	1.5 years	2 years	2.5 years	3 years
S&P 500	0.67	0.69	0.57	0.59	0.62	0.57
NASDAQ 100 Stock Index	0.59	0.72	0.55	0.57	0.61	0.56
Russell 2000 Growth Index	0.53	0.63	0.55	0.67	0.67	0.61
MSCI AC World ex-USA Small Cap	0.86	0.64	0.50	0.60	0.59	0.55
MSCI AC World ex-USA	0.70	0.55	0.40	0.55	0.56	0.51
MSCI Emerging Markets Index	0.43	0.35	0.24	0.53	0.52	0.46
S&P GSCI Gold TR Index	0.80	0.50	-0.14	0.03	0.11	0.12
Bloomberg U.S. Government	-0.29	0.23	-0.06	0.06	0.00	-0.01

Source: Bloomberg, as of June 30, 2022. Calculation based on monthly periodicity.

Starting with the three-year period, we note that there is a low positive correlation between the price movements of Bitcoin to the S&P 500, Nasdaq 100, Russell 2000 Growth, and MSCI ACWI ex-USA Small Cap indices, with stronger correlation appearing in more recent time periods. Looking at the three-year numbers, we can observe that the price of Bitcoin does not move in tandem with gold and hence the view that crypto is to be viewed as "Digital Gold" is misplaced.

Despite the three-year number disproving the "Digital Gold" reference, there is a positive correlation between gold and Bitcoin in the six-month timeframe. Still, this correlation may be deemed as spurious, given that there is little correlation in longer time periods. We acknowledge that 36 months of data are needed to obtain a basic understanding of correlations, but for this exercise, we included shorter time periods to observe changes within the sample period.

From this output, correlations are substantially higher within the Small Cap indices, which could provide some insight regarding how the general market perceives Bitcoin from a risk/return perspective.

While there might not be a useful/long price history for Bitcoin, we did narrow our focus by honing in on two recent but distinct time periods, the most recent rising interest rate period and the COVID-19 pandemic period. These two periods were selected as both encompassed either extreme volatility within these markets or drastic movements. The output from correlation analysis information is shown below:

Correlation with Bitcoin	Rising Interest Rates Dec 2016 - Jan 2019	COVID-19 Pandemic March 2020 – June 2022
Bitcoin	1.00	1.00
S&P 500	0.10	0.64
NASDAQ 100 Stock Index	0.13	0.60
Russell 2000 Growth Index	-0.07	0.68
MSCI AC World Index Small Mid Cap	0.24	0.63
MSCI AC World ex-USA	0.22	0.59
MSCI Emerging Markets Index	0.18	0.56
S&P GSCI Gold TR Index	0.12	0.07
Bloomberg U.S. Government	0.03	-0.04

Source: Bloomberg, as of June 30, 2022. Calculation based on monthly periodicity.

For the "Rising Interest Rates" period, it is evident that there is no real correlation between price movements in Bitcoin and any of the indices. For the "COVID-19" period, the information reflects the two-year numbers from the previous chart. Once again, we see a positive correlation during the more recent volatility, but nothing significant. This pattern of correlation may be due to Bitcoin still being in its "price discovery phase" as the markets grapple with the role that cryptocurrencies will play in our broader economic future.

This correlation during the "COVID-19" crisis points us in the direction that Bitcoin may possibly be viewed as similar to equities, with a spillover of investor sentiment between asset classes increasing in episodes of financial market volatility. It is worth noting that the crypto market has grown drastically, which has impacted prices substantially. At the beginning of this time period, trading volumes for December of 2016 stood at 1.27 million compared to 12.14 billion in April 2022. More people and more transactions equate to better price discovery.

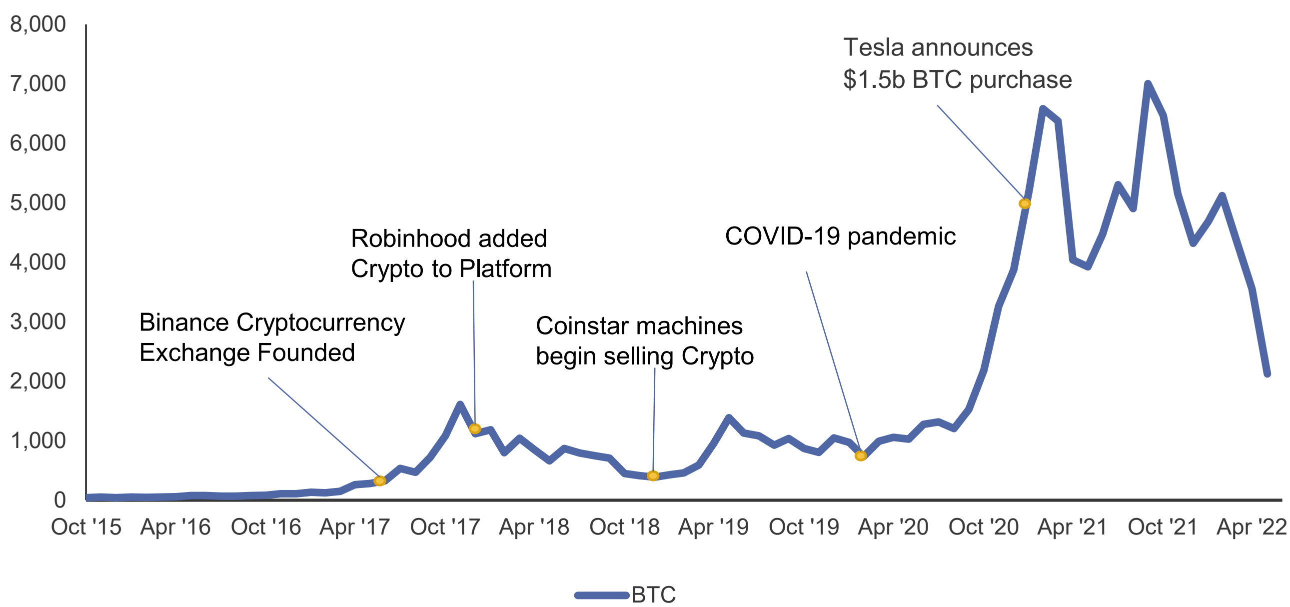
We acknowledge that the correlations between Bitcoin and some of the indices have increased, so there could be some commonalities beneath the surface. From our perspective, there are other factors that may cause Bitcoin and some of these indices to move in a correlated fashion:

- **Overlap in Technology aspects:** Indices including the Nasdaq 100 and the Russell 2000 Growth are made up of a relatively large number of technology stocks. We posit that those who invest in "tech" may similarly invest in crypto as they share overlapping qualities, and some new tech companies even have crypto exposure on either the balance sheet or income statement.
- **Meme traders:** Given the increased amount of savings during the beginning of the pandemic and the advent of the "meme traders," we also see greater numbers of individual investors beginning to trade crypto on platforms such as Robinhood. This group of investors were known for investing in risky and "new" areas, including tech startups, crypto, and NFTs in order to chase yields. These investors may have treated crypto in a similar fashion to equities as this is the asset class with which they are most familiar.

To fully understand and appreciate why the three-year history for Bitcoin is perhaps more important than in the past, we dug a bit deeper. Our initial thought was that as access to this market increased, correlation to risk assets would reflect that expectation. To verify this, we not only created a chart for monthly trading volume, but also tracked the price of Bitcoin versus key developments in access to the cryptocurrency market. From the charts below, it is evident that the price of Bitcoin increased dramatically during the "COVID-19" pandemic, as the trading volume increased at an exponential rate.

As access and recognition increase, we see the impacts of investor sentiment impacting the correlation of price movements between Bitcoin and U.S. equities similarly. We do acknowledge that by flooding the market with pandemic stimulus, some of the money which wasn't being spent had to go somewhere, hence leaking into both the stock market and cryptocurrency exchanges.

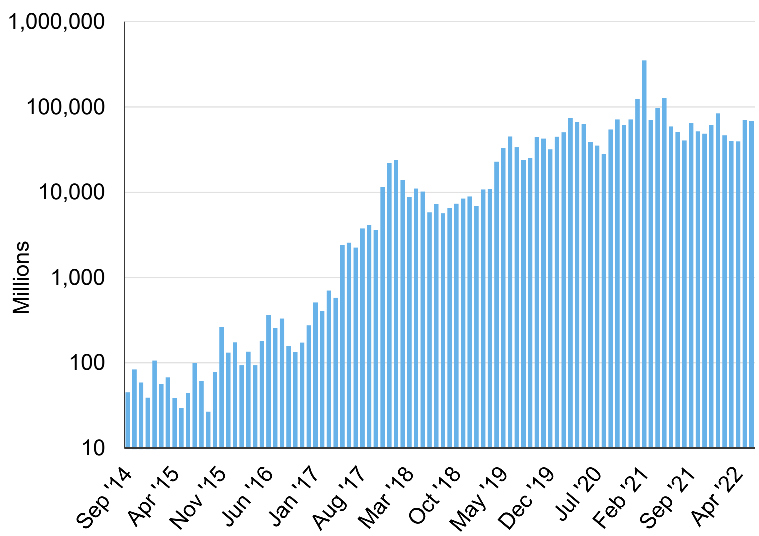
Price History of Bitcoin



Source: Bloomberg.

With all of this data in context, we now see that Bitcoin does not serve as an inflation hedge as some have assumed. While we have concluded that we cannot treat Bitcoin as totally uncorrelated with equities, we are unable to conclusively say Bitcoin (nor other cryptocurrencies using Bitcoin as a proxy) should be treated similarly. While this evaluation for correlation is promising, it is limited due to the "newness" of crypto as being considered by many to be an asset class. The older data available is less reliable because the liquidity/trading volumes were so low, and we do not currently have sufficient data to make a more definitive statement. Additionally, there are important differences between equities and cryptocurrency that mean risks are significantly higher.

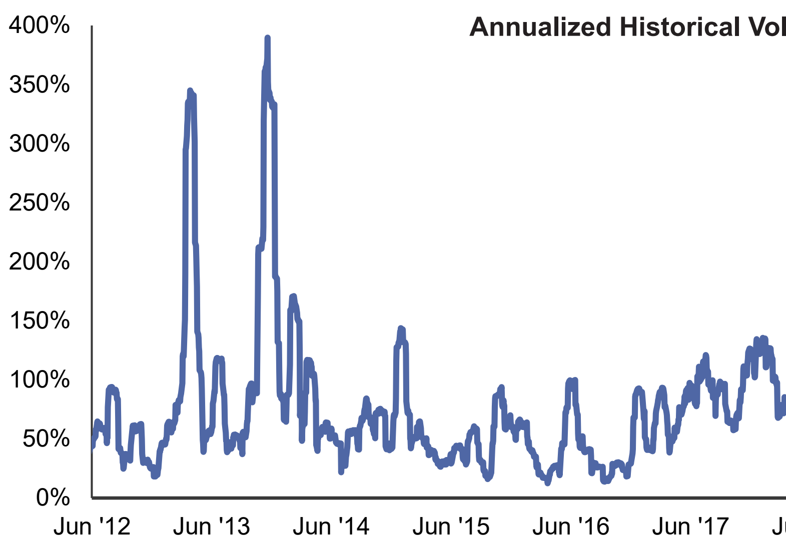
Bitcoin Trading Volume



Source: CoinMarketCap.

Volatility

Although there is some correlation with the U.S. stock market, Bitcoin is significantly more volatile. One of the main reasons for this is the modes of exchange. Cryptocurrencies trade on a global level, on a number of different exchanges, around the clock. On weekends, when trading is thin, prices can fluctuate drastically, and there are no circuit-breakers or cool-off periods — as there are with equities. Additionally, there are Bitcoin "whales" in the market — investors with BTC holdings in the tens of millions or more that have an outsized impact on the relatively small market. According to the National Bureau of Economic Research, one-third of all Bitcoins were held by the top 10,000 investors at the end of 2022. That is a distinct difference from the public market when judged against the 95.25% average free float percentage of the members of the S&P 500 as of June 30, 2022.[3]



Bitcoin is extremely volatile, for reference, during the same time frame Euro/USD has an average monthly volatility of 3.48% as of June 30,2022.[3]

Source: Bloomberg.
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3 Bloomberg.

Other Risks

While cryptocurrencies are based on distributed ledger technology that should, in theory, have a certain level of security built into it, there are risks that a crypto investor faces that others do not. Cryptocurrencies are currently subject to a great deal of scrutiny due to the general lack of regulation and oversight. Due to this lack of regulation, investors face issues such as fraud, or exchanges holding crypto hostage, and the evolving nature of crypto regulations means that investors need to stay up to date on new regulatory activities. Additionally, while many believe crypto to be "un-hackable" due to its underlying blockchain technology, there are instances where blockchains have been hacked, hence cybersecurity risk becoming more relevant. In a June 2022 Forbes article authored by Marcia Garcia Santillana Linares, she details how the Harmony Horizon Bridge platform lost $100 million across several coins after its blockchain bridge was hacked.

Conclusions

Based on our assessment, at a high level, Bitcoin is not a viable hedge for inflation nor a proper store of value based on the fluctuations of price. While recent correlation data may point to Bitcoin being treated in a manner similar to equities, due to the relative newness of the asset class, and the inability to truly define a tangible value, we cannot make conclusive statements on that relationship. Recently, the U.S. Senate brought forth a bill which would give the Commodity Futures Trading Commission authority over Bitcoin and Ethereum (another cryptocurrency), with all other cryptocurrencies and NFTs possibly falling under the oversight of the SEC.[4] While this is a proposed law, it may begin to pave the way for legitimacy and regulation with Bitcoin and Ethereum, which is positive for institutional investors seeking exposure to these cryptocurrencies.

Currently, the use of Bitcoin and by extension, crypto as a whole, is still being defined. The blockchain technology behind the creation of crypto has been one of the main focal points for institutional investors because of the opportunities it may provide, but again, the actual purpose or usage/need of tokens has yet to be defined. Not having a clearly defined path or usage for these tokens/coins is the biggest pushback on their true purpose, which in turn has led some investors to believe this could be nothing more than the equivalent of a large and unregulated Ponzi scheme. At PFM Asset Management, we might not yet know how this marketplace will develop over time, but we continue to monitor it because the technology that emerges from crypto may soon change the way we do business and, in fact, various aspects of everyday life.

4 Jesse Hamilton, "U.S. Senate Bill Will Give CFTC Crypto Market Oversight – but Doesn't Say How Much", CoinDesk, August 3, 2022, https://www.coindesk.com/policy/2022/08/03/us-senate-bill-will-give-cftc-crypto-market-oversight-but-doesnt-say-how-much/.

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