



PGIM
India Mutual Fund

MEGATRENDS

CRYPTOCURRENCY INVESTING

Powerful Diversifier or Portfolio Kryptonite?

SUMMER 2022

INTRODUCTION

Red dogs, stump tails and blue pups were just some of the creative names for the ultimately doomed currencies issued by poorly capitalized state-chartered banks during the wildcat banking era in U.S. monetary history from 1837 to 1863 – until Congress finally passed legislation that created a single centrally backed national U.S. currency.^{1,2}

History rarely repeats itself, but it often rhymes – and 150 years later we are in an era with thousands of unregulated cryptocurrencies and digital tokens with a collective market cap over \$1 trillion.³ These cryptocurrencies offer the promise of a frictionless, inclusive and decentralized network powered by blockchains and operated completely independently of central banks, which are increasingly seen as debasing fiat currencies by “printing money.”*

For institutional investors, cryptocurrencies also offer the allure of extraordinary and diversified returns in a market that is now of sufficient size and liquidity for meaningful institutional positions. Indeed, some market participants estimate that about 5% of total Bitcoin supply are now held by institutional investors via custodial intermediaries.⁴

To understand the investment implications of the evolving cryptocurrency landscape, we have drawn on the insights of more than 30 investment professionals across PGIM’s fixed income, equity and private alternatives managers – as well as leading economists, venture capitalists and crypto investors. Our resulting conclusions:

- While a few cryptocurrencies will endure on the fringes of the monetary system, **the broad replacement of fiat currencies globally by cryptocurrencies is unlikely to materialize. Functionally, cryptocurrencies are unable to meet the basic prerequisites of either a currency**

or a precious-metal substitute – shortcomings exacerbated by the powerful headwinds from increasing regulatory scrutiny and the growing likelihood of central bank digital currencies (CBDCs) which provide almost all the functional benefits of fiat-linked cryptocurrencies, but with no liquidity or credit risk.

- Beyond hedge funds exploiting inefficiencies to generate alpha on the other side of “FOMO”-driven, largely retail and speculative flows, there is currently no compelling case for direct ownership of cryptocurrencies as a meaningful share of an institutional portfolio. Theoretically, cryptocurrencies have no ex-ante foundational underpinnings for delivering robust risk-adjusted returns in the future. Empirically, after examining the brief historical data available on crypto, **we find little real-world evidence that cryptocurrencies deliver diversification vs. mainstream assets, are effective inflation hedges, possess the intrinsic characteristics of a safe-haven asset, or advance ESG objectives.** Of course, it goes without saying that bitcoin and many other cryptocurrencies have delivered awe-inspiring returns over the last decade – albeit with frequent and substantial drawdowns – and this speculative momentum could continue for some time.
- In contrast to direct cryptocurrency ownership, **there are attractive institutional investment opportunities in the broader crypto ecosystem and the incidental innovation that has flourished in the creation of bitcoin and other cryptocurrencies.** These include private applications of distributed ledger technology and smart contracts used in financial services (like clearing and settlement of securities and international payment systems) as well as

* To sharpen our focus, we limit our analysis to crypto assets intended as substitutes for fiat currencies, such as bitcoin, ether and sol, which collectively represent close to 60% of the sector’s market cap. Digital tokens specific to a particular application or sidechain are not our primary focus. We also explicitly exclude regulated central bank digital currencies (CBDCs) and non-fungible tokens (NFTs) from our analysis, except where they intersect with and influence our view on crypto opportunities and risks.

in logistics and supply-chain management. Tokenization could be a next-generation securitization mechanism for real assets. Additionally, the companies providing the essential infrastructure for crypto innovation will have a head start in underpinning CBDCs and other blockchain-powered applications. This collateral innovation has the potential to generate attractive returns for owners of the companies that provide these services but will not necessarily accrue to the owners of cryptocurrencies.

We share analysis to support our hypotheses and unpack the critical investment implications of these conclusions in the rest of this report. Chapter 1 summarizes the cryptocurrency landscape, cutting through the breathless media hype. Chapter 2 explains why cryptocurrencies are deeply inadequate as

currencies. Chapter 3 lays out the empirical evidence for why cryptocurrencies fail to meet most institutional investor objectives around portfolio diversification, risk-adjusted returns, inflation protection and ESG. To “stress test” our conclusions, we also lay out the potential scenarios that would need to materialize for the extraordinary price trajectory of bitcoin and other cryptocurrencies to continue. Our base case is these scenarios are highly unlikely to materialize.

Finally, Chapter 4 argues that enduring value for long-term investors will be found not in cryptocurrency holdings themselves, but in the use cases and applications from the remarkable breakthroughs that are the accidental by-products of the heroic but potentially doomed quest to build a viable decentralized, unregulated peer-to-peer payment system.

About PGIM

PGIM, the investment management business of Prudential Financial, Inc. (PFI), has a history that dates back over 145 years and through more than 30 market cycles.* Built on a foundation of strength, stability and disciplined risk management, PGIM's more than 1,300 investment professionals are located in key financial centers around the world. Our firm is comprised of six autonomous asset management businesses, each specializing in a particular asset class with a focused investment approach. This gives our clients diversified solutions from a leading global asset manager with global depth and scale across public and private asset classes, including fixed income, equities, real estate, private credit and other alternatives. For more information, visit www.pgim.com.

* 30 market cycles represents PFI's asset management expertise through PGIM, its affiliates and its predecessors.

CHAPTER 3

CONSIDERING BITCOIN FOR AN INSTITUTIONAL PORTFOLIO

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The time has come to seriously examine what role bitcoin might play in an institutional multi-asset portfolio.”

CHAPTERS

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CONSIDERING BITCOIN FOR AN INSTITUTIONAL PORTFOLIO

The spectacular returns, growing scale and market cap of the crypto universe, the search for higher real returns in a yield-starved investment universe as well as their purported role as “digital gold” — a safe haven in volatile times — has led many institutional investors to at least consider allocating a small percentage of their portfolio to cryptocurrencies.

Even for the most hardened skeptics, the time has come to seriously examine what role bitcoin might play in an institutional multi-asset portfolio, particularly in an era of rising geopolitical and inflation risks.

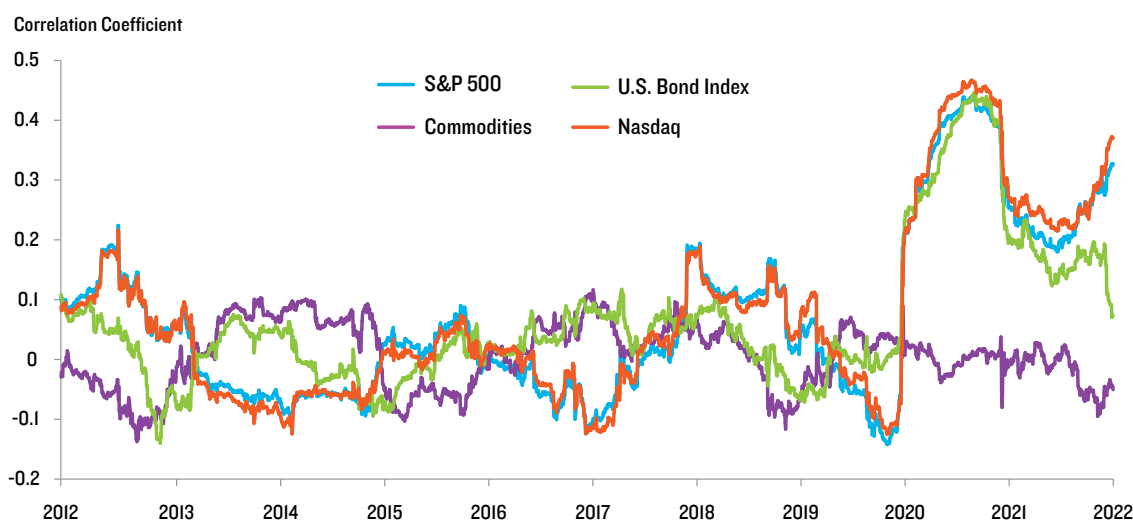
While it would be foolhardy to arrive at a definitive verdict given the brief time period since Bitcoin’s inception and the ongoing evolution of cryptocurrencies, our evaluation of the evidence to date strongly suggests that, despite robust valuations and the conviction of ardent crypto enthusiasts, direct investment in bitcoin or other cryptocurrencies currently offers little benefit to institutional investors and considerable volatility and regulatory risk.

Are cryptocurrencies an effective portfolio diversifier?

Given its deliberate detachment from sovereign states and monetary institutions, bitcoin would appear to be less impacted by classic macroeconomic factors than conventional asset classes such as equities, bonds or commodities.

Unfortunately, for investors looking for diversification, bitcoin’s correlation with equities and commodities has been unstable and trending higher of late. Between 2013 and 2019, bitcoin had a near-zero average correlation with broad U.S. equities and commodities. Starting in 2020, however, its

Exhibit 6: Bitcoin Correlation with Various Assets
(Rolling 1-year)



Source: PGIM analysis; Refinitiv and Bloomberg.

Note: The Bloomberg Commodity Index and Bloomberg Aggregate Bond Index were used for Commodity and Bonds respectively.

correlation with U.S. equities and commodities spiked sharply and has remained consistently positive since (Exhibit 6). Even the International Monetary Fund has noted the “increased and sizable co-movement and spillovers between crypto and equity markets indicate a growing interconnectedness” that is a growing source of systemic risk.²⁷ This suggests cryptocurrencies may not be particularly effective as a portfolio diversifier going forward.

Bitcoin’s correlation with equities and commodities has been unstable and trending higher since 2020.

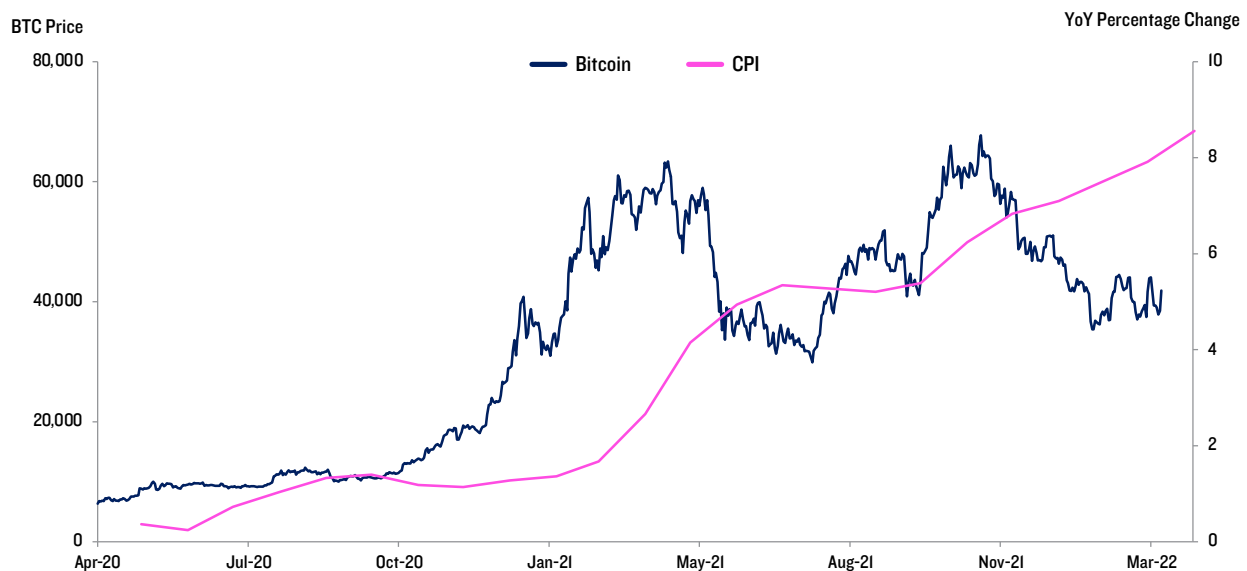
That an emerging asset class has a growing correlation with other assets as it matures is not only theoretically plausible but has historical precedent. Some frontier equity markets have demonstrated a similar tendency in the past. It should therefore come as no surprise that as bitcoin has gone mainstream it has also grown more

sensitive to the broader liquidity and risk sentiment factors that move other assets. In fact, market factor analysis demonstrates that bitcoin has developed a strong “trend following” tendency and more investors view bitcoin as a high-beta, risk-on asset.²⁸

Is bitcoin an effective hedge against inflation?

Bitcoin is scarce. That is, its supply is limited to 21 million coins and this is hard-coded into the bitcoin algorithm. This constraint suggests its value, much like gold, may be resistant to fiat monetary debasement or price inflation. However, there is scant evidence to support this thesis. In the lone episode of elevated U.S. inflation since the introduction of cryptocurrencies, bitcoin provided only limited inflation protection. U.S. prices were whipsawed during the pandemic and inflation began to soar steadily in 2021 and into 2022. The price of bitcoin moved with inflation only for a brief time before falling sharply (Exhibit 7). Gold, on the other hand, has demonstrated since the 1970s that it can be a reasonably effective and reliable long-term inflation hedge.²⁹

Exhibit 7: U.S. Inflation vs. Bitcoin Price



Source: Bloomberg and Federal Reserve Economic Data.

How does bitcoin's volatility and risk-adjusted return compare to other assets?

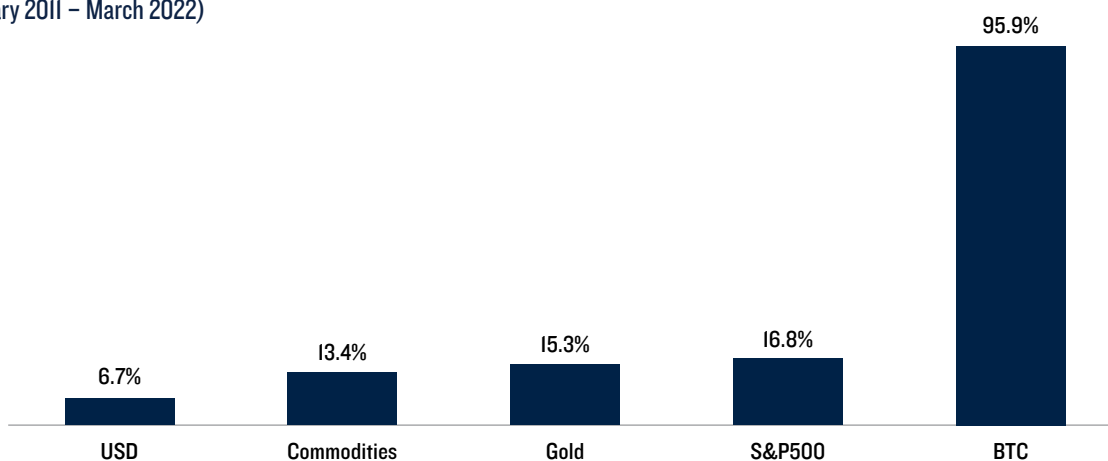
Bitcoin has a justified reputation for being *substantially* more volatile than other asset classes (Exhibit 8).

This extreme volatility manifests itself in far more instances of 10%, 25% and even 50% drawdowns

than either equities or commodities over its brief history. Between June 2010 and March 2022, bitcoin recorded more than 25 episodes of drawdowns of 25% or more. By comparison, equities and commodities recorded just one each (Exhibit 9).

When considering risk-adjusted returns, bitcoin had an extraordinary risk-return profile early on. However, it has not retained this superior performance.

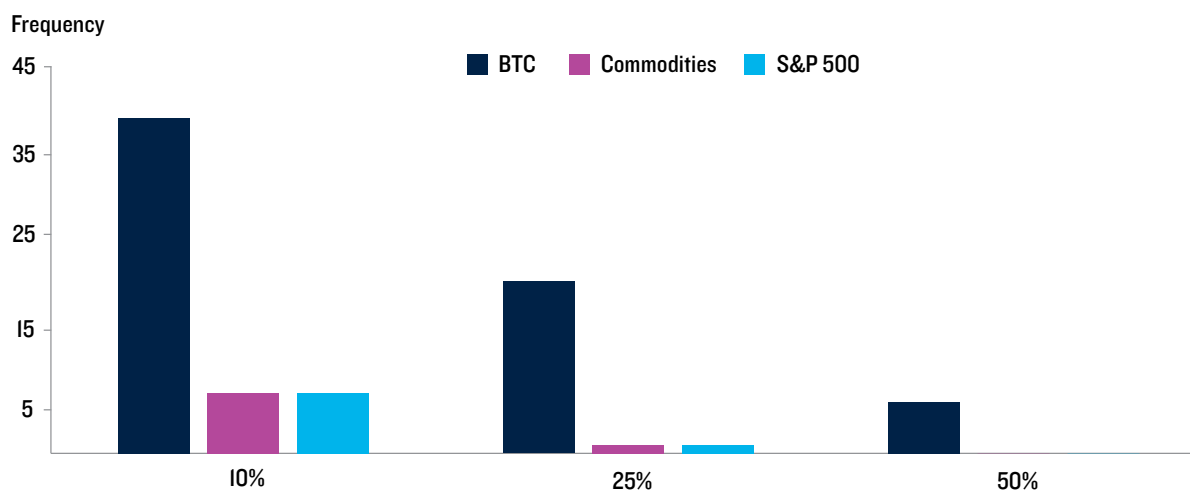
Exhibit 8: Asset Volatility
(January 2011 – March 2022)



Source: PGIM Thematic Research; Refinitiv and Bloomberg.

Note: Volatility of daily returns, annualized. The Bloomberg Commodity Index and London Bullion Market Association Gold Price were used for Commodities and Gold respectively.

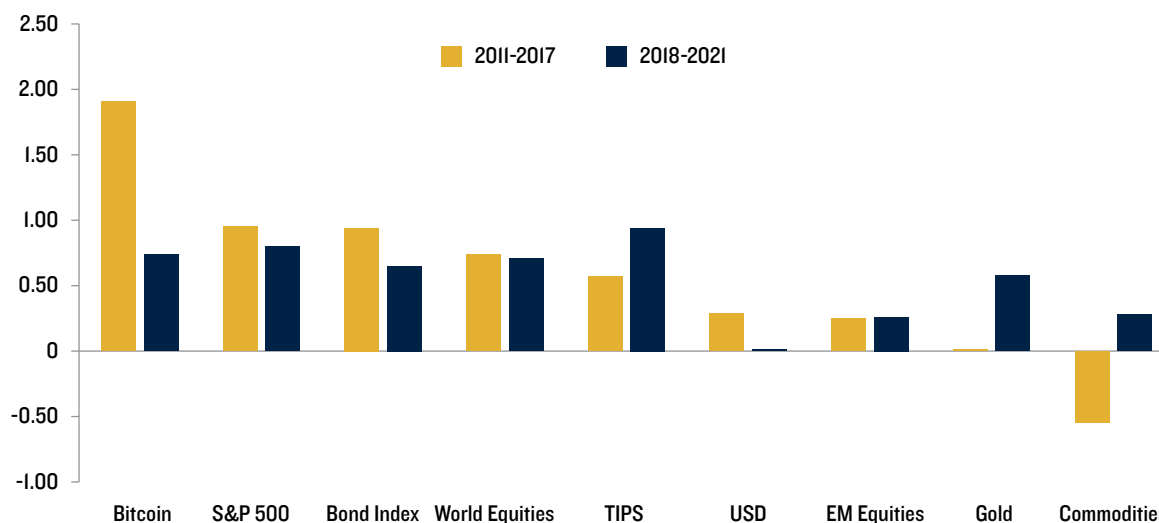
Exhibit 9: Frequency of Drawdowns
(June 2010 – March 2022)



Source: PGIM Thematic Research; Bloomberg and Refinitiv.

Note: Drawdowns calculated over a 3-month rolling window. The Bloomberg Commodity Index was used for Commodities.

Exhibit 10: Sharpe Ratios of Select Asset Classes



Source: PGIM Thematic Research; Refinitiv and Bloomberg.

Note: The MSCI World Index, Bloomberg Aggregate Bond Index, Bloomberg Inflation-Linked Bond Index, U.S. Dollar Index, MSCI Emerging Markets Index, London Bullion Market Association Gold Price, and Bloomberg Commodity Index were used for Global Equities, Bond Index, TIPS, USD, EM Equities, Gold, and Commodities respectively.

Since 2018, its Sharpe ratio has been similar to other assets (Exhibit 10). Given the frequency and severity of drawdowns and its diminished risk-adjusted performance since 2018, it is not clear what role an asset class offering zero yield and dubious diversification qualities should play in a long-term strategic portfolio allocation.³⁰

Bitcoin had an extraordinary risk-return profile early on, but it has not retained this superior performance.

Does bitcoin function as a safe-haven asset? Is it “digital gold”?

Like gold, bitcoin is not issued nor controlled by an institution, central bank, or government. This characteristic has enabled gold to serve as a safe-haven asset during some periods of increased economic or political uncertainty. Does bitcoin share some of those characteristics as well? No, it does not.

For starters, the theoretical foundations of cryptocurrencies as a safe haven are somewhat shaky. A white paper, no matter how elegant, cannot decree a safe haven. In contrast, gold and other precious metals have held some financial status for over 2,000 years.³¹ Furthermore, many precious metals have multiple consumer and industrial uses that – unlike cryptocurrencies – give them a non-zero price floor.³² For example, currently about half of gold production goes to jewelry, one-tenth to industry and a quarter to back central bank reserves.³³

More importantly, the empirical evidence to date does *not* support the hypothesis of bitcoin as a safe haven. Over its short history, bitcoin has not exhibited stability in its value. Between 2015 and 2022, for example, its volatility was consistently *much* higher than other conventional safe-haven assets such as gold, U.S. Treasuries, or the U.S. Dollar (Exhibit 11).

The true test for a safe-haven asset, however, is how it retains its value during a period of extreme and widespread market volatility. Bitcoin was not exactly a steadying force in early 2020 when global asset prices spiraled downward due to worldwide COVID-induced shutdowns. It did *not* exhibit safe-haven characteristics at that time and held *far less* of its value

than conventional safe-haven assets like gold and the U.S. dollar (Exhibit 12).

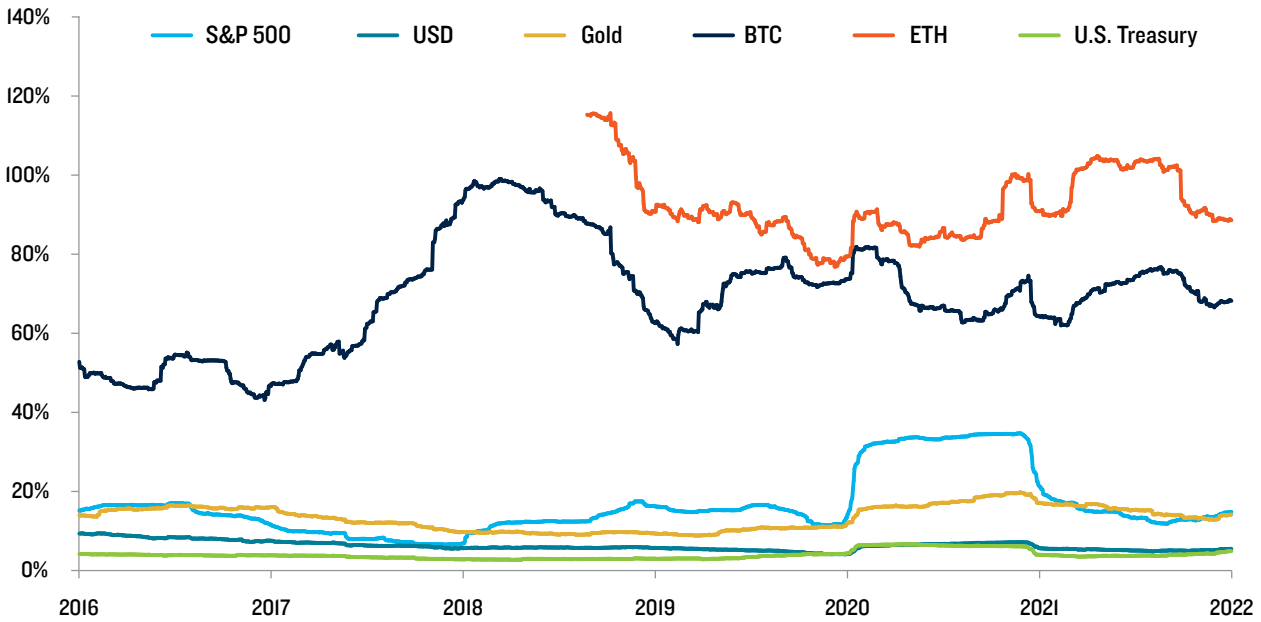
Does bitcoin offer any short-term alpha opportunities?

Some features of cryptocurrency markets, especially the wild price gyrations, provide opportunities for active trading. In particular, hedge fund strategies

can potentially exploit market inefficiencies and dislocations that arise in these immature, retail- and momentum-driven markets.

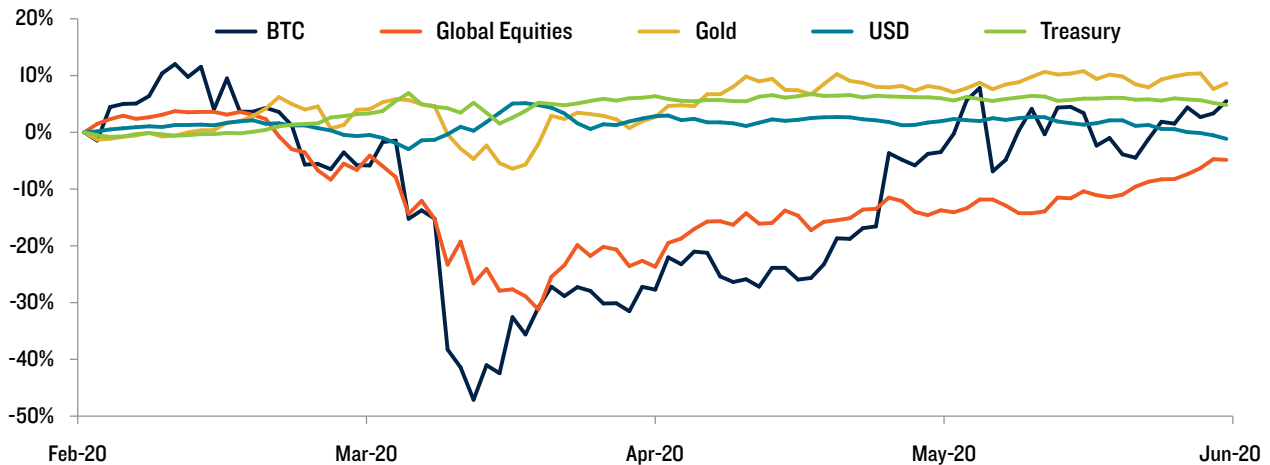
Dislocations in the nascent cryptocurrency market draw comparisons to other less efficient frontier markets. For example, futures contracts for some cryptocurrencies are not standardized and their prices do not always align with spot markets

Exhibit II: Price Volatility of Select Asset Classes



Source: Refinitiv and Bloomberg.
 Note: Annualized rolling 1-year volatility. The London Bullion Market Association Gold Price and Bloomberg Treasury Index were used for Gold and Treasuries respectively.

Exhibit 12: COVID Market Drawdown



Source: Refinitiv and Bloomberg.
 Note: The MSCI World Index, London Bullion Market Association Gold Price, and Bloomberg Treasury Index were used for Global Equities, Gold and Treasuries respectively.

across exchanges, creating arbitrage opportunities that quant hedge funds have been successfully exploiting.³⁴ In addition, the extraordinary volatility of cryptocurrencies presents a wide range to trade in. Also, similar to frontier markets, liquidity and leverage can be unreliable and scarce in cryptocurrency markets.³⁵ Such a backdrop provides return potential for market players who have the capability of providing leverage or liquidity to the market when it is needed most. These alpha opportunities are available to a range of multi-strategy and quantitative hedge funds.³⁶

Cryptocurrencies are problematic along multiple dimensions of ESG.

How do cryptocurrencies align with overall ESG objectives?

For sustainability-minded investors, cryptocurrencies are problematic along multiple dimensions of ESG.

Environmentally, the most worrying aspect of cryptocurrency is its massive energy consumption. Major blockchains – including bitcoin and the original Ethereum – currently utilize a proof-of-work (POW) mechanism to validate transactions that is extremely energy intensive. With a POW validation structure, miners on the blockchain compete for the right to create the next block in the chain by solving complex computational problems. This race typically involves thousands of competitors and is repeated every 10 minutes or so. Each of the competitors utilize computing power and consume electricity, while only one of them wins and is rewarded with newly minted coins.

Because of this highly decentralized validation process, just a single transaction on the bitcoin blockchain, for example, requires enough energy to power the average American home for over two months and has a carbon footprint equivalent to 2 million transactions on the Visa network (Exhibit 13). The total electrical energy use around bitcoin annually is on par with the power consumption of countries like Thailand, South Africa and Ukraine.³⁷ In fact, the soaring demand for

electricity from bitcoin miners has given new life to carbon-intensive energy sources – like fossil fuel power plants – as well as raising concerns over diverting scarce renewable energy from other potential uses.³⁸

The intense energy consumption around bitcoin mining and validation is a major reason several countries – including China – have banned mining altogether.³⁹ Indeed, in the wake of the Chinese ban, mining activity has shifted to alternate locations like Kazakhstan, Canada and Texas and has strained power grids in some of these new locations.^{40, 41}



Subsequent iterations of blockchain such as Cardano and Solana reduce their energy footprint through the use of different, less energy-intensive validation mechanisms. Indeed, even Ethereum is planning a transition to this proof-of-stake validation process in late 2022. However, critics suggest these less energy-intensive validation protocols may be less secure.⁴² Nevertheless, the oversized energy footprint of bitcoin remains a major area of concern for ESG investors.

Socially, cryptocurrencies offer the promise of being more inclusive and accessible, providing a digital platform to underbanked households. However, many mobile phone-based payment services in developing countries (e.g., M-Pesa's domestic money transfers in Kenya and Tanzania or Grameen Bank's international remittance pilots in Bangladesh) have alleviated some of these financial inclusiveness concerns. Mobile phones, of course, are more widely available than high-speed internet service and these payment networks require neither a new currency nor new payment infrastructure.

Furthermore, when it comes to the distribution of wealth, there is no reason to think crypto wealth is less unequal than conventional wealth, and recent empirical research confirms that the distribution of holdings of bitcoin does significantly differ from the distribution of wealth in the U.S. – 0.25% of total global accounts control roughly 20% of the bitcoins in circulation.⁴³

Finally, from a governance perspective, the anonymity and difficulty in identifying cryptocurrency ownership raises significant concerns around anti-money laundering (AML) and sanction evasion. Regulatory scrutiny of these risks is growing.

Exhibit 13: Annualized Bitcoin Power Usage and Carbon Footprint

	ANNUALIZED BITCOIN FOOTPRINTS	SINGLE BITCOIN TRANSACTION
 CARBON FOOTPRINT	Czech Republic The annual carbon footprint of BTC (114 Mt CO ₂) is comparable to the annual carbon emissions of the Czech Republic.	2 Million A single BTC transaction has a carbon footprint (1,180 kg CO ₂) equivalent to two million Visa transactions.
 ELECTRICAL ENERGY	Thailand BTC uses as much electricity annually (204 TWh) as the entire nation of Thailand.	73 Days A single BTC transaction consumes sufficient electrical power (2,200 kWh) to power an average U.S. household for 73 days.

Source: "Bitcoin Energy Consumption Index," Digiconomist, March 2022.

For example, South Korean regulators are auditing commercial banks' ties to cryptocurrency exchanges for AML adequacy and U.K. cryptocurrencies now need to comply with AML requirements by April 2022 as well.^{44, 45}

On sanction evasion, concerns have escalated with the war in Ukraine. Increased trading between ruble and crypto suggest evasion of financial sanctions. Furthermore, links between sanctioned individuals and cryptocurrency wallets, have culminated in the seizure of multiple crypto accounts.^{46, 47, 48}

Will the risk profile of cryptocurrencies improve or worsen going forward?

Our base case is that (1) regulatory uncertainty will decrease as policy frameworks and legal guidelines catch up with the frenzied pace of growth and innovation in the crypto ecosystem, but with that greater clarity will come more rigor; (2) tougher cryptocurrency regulations may act as a significant headwind on the industry; (3) there may be a real threat to the survival of many cryptocurrencies from central bank digital currencies.

First and foremost, a lack of clear and uniform regulations – both across and within countries – has led to tremendous uncertainty for long-term investors evaluating cryptocurrencies for their portfolio.⁴⁹ It remains ambiguous, for example, when a cryptocurrency in the U.S. falls under the regulatory framework of a security – and thus subject to SEC regulations about issuance – and when it is deemed to be an asset like bitcoin and Ethereum have claimed. This lack of clarity around a fundamental question is emblematic of the material policy risks facing crypto investors.

Some regulators are keen to nurture the innovation around cryptocurrencies and blockchain technology. The UK government, for example, is planning to accept stablecoins as a form of payment in a push to become a global hub of crypto innovation.⁵⁰ Meanwhile, other regulators view cryptocurrencies as a major risk to both consumers and to the commercial banking systems they oversee.^{51, 52}

In addition to unclear regulation and rising scrutiny, cryptocurrencies are facing outright prohibition in some countries. China's abrupt banning of all cryptocurrency trading and mining in the fall of 2021 is a prominent example, but by no means the

only one (e.g., Egypt and Bangladesh).⁵³ Even when not explicitly prohibited, some countries are taking measures to rein in crypto trading. India, for example, has decided to tax income from the transfer of cryptocurrencies at 30%.⁵⁴

Market manipulation is another area of concern. With almost no regulations around cryptocurrency insider trading or price manipulation, celebrity crypto

influencers can send market prices soaring or tumbling with impunity. In May 2021, a series of tweets by Elon Musk, mentioning personal and corporate activity in bitcoin, sent the price of bitcoin soaring by as much as 10%.⁵⁵ This was not the only incident, as supportive tweets around dogecoin led to short-lived 30% gains.⁵⁶ This came just two weeks after prior comments sent dogecoin prices into sharp decline.⁵⁷

Box I: What do investors need to believe to justify cryptocurrency valuations?

What do you have to believe?	Why this outcome is not our base case
<p>Spiraling inflation from central banks “printing money” and excessive government debt leads market participants to abandon government-issued fiat currencies for cryptocurrencies across most transactions.</p>	<p>Fighting inflationary pressure remains a key objective for central banks, with a greater risk they overshoot in monetary tightening and rate increases triggering a recession. In any case, persistently high inflation in a few G8 currencies would more likely lead to a shift to other major fiat currencies rather than bitcoin.</p>
<p>Cryptocurrency’s extreme volatility turns out not to be a retail-fueled speculative bubble but the price discovery journey of a new asset class that slowly becomes a stable and truly diversifying addition to investor portfolios. In this scenario, bitcoin matures into “digital gold” and takes a significant share of gold’s market share as an institutional asset.</p>	<p>While multiple bitcoin rallies may imply more staying power than typical bubbles, cryptocurrency pricing is likely based on speculative behavior and a fundamental thesis around its value has yet to emerge. Furthermore, with limited evidence that bitcoin is an inflation hedge or safe-haven asset it is unlikely cryptocurrencies will be widely held by institutional investors.</p>
<p>Major cyberattacks overwhelm traditional financial institutions as well as wholesale and retail payment networks. With plummeting trust in the formal banking system, market participants turn to cryptocurrencies to seek security and reliability.</p>	<p>Cyberattacks that systematically derail the global payment networks for a sustained period would likely also disrupt the global internet infrastructure – making mining, trading and using cryptocurrencies quite problematic.</p>
<p>Major central banks fail to launch CBDCs due to a desire to protect the conventional banking system, technological and operational shortcomings in the public sector, or just general ineptitude. In the absence of major CBDCs, digital stablecoins fill the void.</p>	<p>While some central banks will inevitably lag, nearly all major central banks are exploring how to issue digital currencies. China has already launched a digital renminbi. Active discussions are ongoing in the U.S. and the EU, with our base case that several G8 countries will launch CBDCs over the next five years.</p>
<p>Mistrust in governments and institutions by their citizens grows more widespread, perhaps triggered by a global banking sector meltdown. Cryptocurrencies fill the void.</p>	<p>The 2008 financial crisis and COVID pandemic tangibly demonstrated that governments and central banks remain willing and able to support commercial banks under stress. Furthermore, with more than 100 different fiat currencies and central banks, it remains a remote possibility that confidence is depleted in all major fiat currencies simultaneously, so systemic risk in one country or region is more likely to lead to a flight to other fiat currencies.</p>
<p>Human activity moves from the physical to the digital realm, where cryptocurrencies dominate. With gaming, eSports, the metaverse, and Web 3.0 accounting for a material share of global economic activity in the virtual realm, cryptocurrencies see explosive growth.</p>	<p>Our base case is that while the metaverse will take up a growing share of people’s entertainment budgets, especially younger millennials and Gen Z, the majority of people will prefer to spend their non-entertainment resources and time in the physical rather than virtual world. Furthermore, if CBDCs are successfully established, even e-gaming and metaverse activity is likely to shift from crypto to fiat digital currencies.</p>

These episodes of market manipulation have drawn the attention of regulators in some jurisdictions who cite this as a primary reason for rejecting new crypto investment vehicles like bitcoin ETFs.⁵⁸ In response, a coalition of major cryptocurrency firms – including exchanges, digital asset platforms, and crypto software providers – has launched an initiative to self-regulate the industry. The coalition acknowledges the potential for fraud and manipulation in the cryptocurrency space and is urging digital asset companies to sign a “market integrity” pledge that calls for the industry to protect investors.⁵⁹

Regulators and market participants have also been concerned by the notable and repeated breakdowns in the infrastructure supporting cryptocurrency mining and trading. Centralized cryptocurrency exchanges are one example. These exchanges set prices for various digital assets and take a small fee off every transaction. Only a few countries have appropriate guidelines or regulations in place even though more than 300 exchanges are now operating globally.⁶⁰ With the rapid growth in cryptocurrency trading volumes, many exchanges do not have the capital or technical resources to scale up robustly, becoming popular targets for hackers. High-profile hacks of major cryptocurrency exchanges – like Mt. Gox, BitMart, Coincheck, and Binance – have been occurring since 2012 with more than 46 exchanges suffering thefts. The trend appears to be accelerating – overall cryptocurrency theft rose by more than 75% in 2021, totaling more than \$14 billion in stolen assets.⁶¹

Despite the growing investment mythology surrounding bitcoin, direct investment in it does not currently offer an attractive proposition for institutional investors. Specifically, it has not demonstrated enduring characteristics as a reliable portfolio diversifier, safe-haven asset, or inflation hedge. Its risk-adjusted returns of late are comparable

to other asset classes but come with significantly greater frequency of drawdowns. Furthermore, the unsettled and increasingly harsher regulatory backdrop, the immature operational infrastructure supporting it and its problematic ESG attributes pose significant and material risks for institutional investors.

While this is our base case, it is worth considering the alternative scenarios under which cryptocurrencies continue to rise in valuation and importance. We highlight a few of these potential pathways to crypto-dominance, as well as the counterarguments that lead us to currently consider these scenarios unlikely (see Box 1 on the prior page).

Despite the investment mythology surrounding bitcoin it does not currently offer an attractive proposition for investors.

We therefore believe it's important for institutional investors to focus instead on evaluating the potentially more attractive long-term opportunities in the broader crypto ecosystem, beyond cryptocurrencies themselves. Chapter 4 highlights a range of investment opportunities investors will want to evaluate as they consider the more long-lasting and enduring investment ideas in the broader crypto ecosystem that have emerged alongside the cryptocurrency phenomenon.

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