MEGATRENDS

PGIM

Executive Summary

CRYPTOCURRENCY INVESTING

Powerful Diversifier or Portfolio Kryptonite?

With a market cap well over $1 trillion, cryptocurrencies have grown too big to ignore. For institutional investors, they offer the allure of extraordinary and diversified returns in a market that is now of sufficient size and liquidity for meaningful institutional positions.

To understand the investment implications of the evolving cryptocurrency space, PGIM's latest paper draws on the insights of over 30 PGIM investment professionals across fixed income, equity, real estate and private alternatives – as well as leading economists, venture capitalists and crypto investors.

Despite the hype, we find little evidence that cryptocurrencies offer any meaningful opportunities for institutional investors. Instead, we argue that enduring value will be found not in direct ownership of cryptocurrencies, but in the real-world applications of blockchains themselves.

Understanding the Cryptocurrency Ecosystem

Bitcoin and other cryptocurrencies are digital assets maintained and recorded on a blockchain without a trusted intermediary like a custodian or bank. Whatever bitcoin's ultimate destiny, the ingenuity displayed in bringing together distributed ledgers and cryptography represents a legitimate technological breakthrough.

Since its launch in 2008, bitcoin has spawned thousands of other cryptocurrencies and digital tokens. Each of these make design decisions along four dimensions: decentralization, security, scalability and stability. Taken together these four dimensions allow one to neatly classify the crowded cryptocurrency space. Every cryptocurrency is a unique and different trade-off between these four elements. However, cryptocurrencies are just one part of the broader crypto ecosystem.

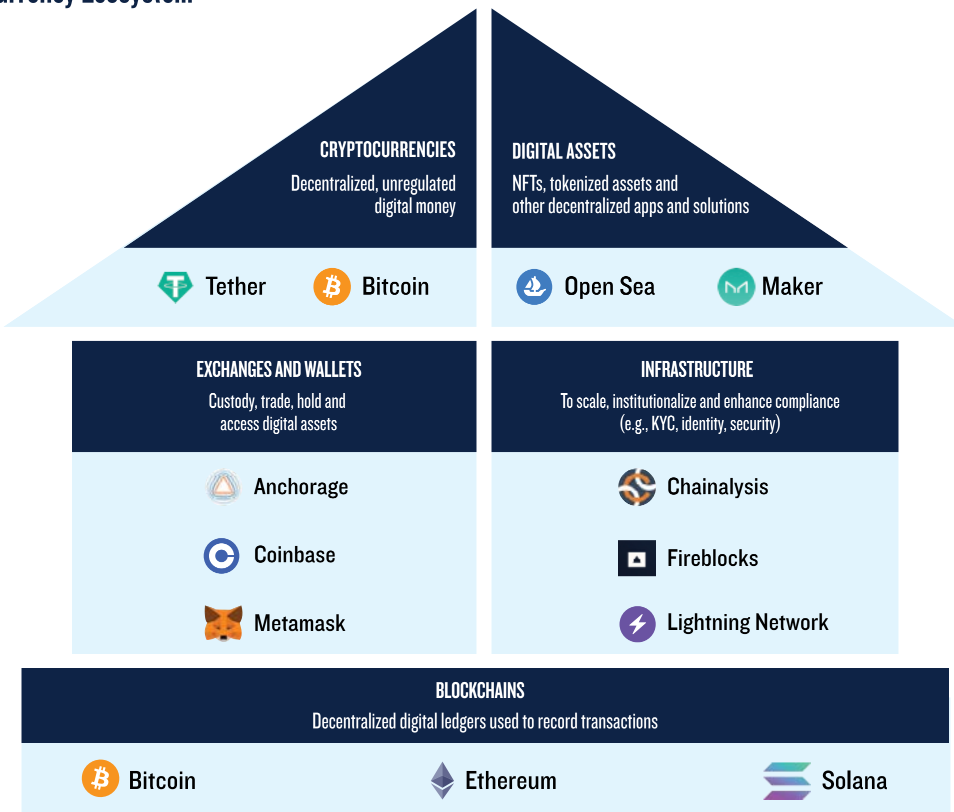
Shortcomings as a Currency

While a few cryptocurrencies will endure on the fringes of the monetary system, the broad replacement of fiat currencies globally is unlikely to materialize. Additional, powerful headwinds come from both increasing regulatory scrutiny and the growing likelihood of central bank digital currencies, which provide the functional benefits of fiat-linked cryptocurrencies without liquidity or currency risk.

Bitcoin, the first and still the most prominent cryptocurrency, does not meet the basic functions of a currency:

- **Store of value:** providing a stable store of value, at least over short periods of time, is an essential function of a currency. The dramatic price gyrations of many cryptocurrencies make them highly unattractive as a store of value – even in the short term.
- **Medium of exchange:** It is indeed telling that even after a dozen years, few commercial enterprises accept bitcoin – or other cryptocurrencies - in exchange for goods and services. This situation is not likely to change soon as bitcoin's maximum transaction speed and cost-efficiency pales in comparison to conventional payment networks.

Exhibit 1: The Cryptocurrency Ecosystem



Source: PGIM Thematic Research.

- **Unit of account:** While some businesses may accept bitcoin as a payment option, very few businesses fix the price of their product in it. Outside of the deep digital realm, bitcoin and other cryptocurrencies are only rarely used to prices goods or services.

Considering Bitcoin for an Institutional Portfolio

Beyond hedge funds exploiting inefficiencies to generate alpha on the other side of retail- and momentum-driven flows, there is currently not a compelling case and little evidence for direct ownership of cryptocurrencies as a meaningful share of an institutional portfolio.

1. Is bitcoin an effective portfolio diversifier?

Its detachment from broad macro factors suggests that bitcoin may be uncorrelated with other asset classes. This was true early in its history. However, it has shown increased correlation with other assets since 2020.

2. Is bitcoin an inflation hedge?

The scarcity of bitcoin's supply and its detachment from governments and institutions suggests its value may be resistant to price inflation. Yet, in the lone episode of elevated U.S. inflation since bitcoin's inception, it has not held its value well.

3. Does bitcoin offer extraordinary risk-adjusted returns?

While bitcoin exhibited some remarkable risk-adjusted returns early in its history, since 2018 its Sharpe ratio has been similar to equities and bonds. Given the frequency and severity of drawdowns and its diminished risk-adjusted returns, it is not clear there is a compelling case for direct investment in bitcoin.

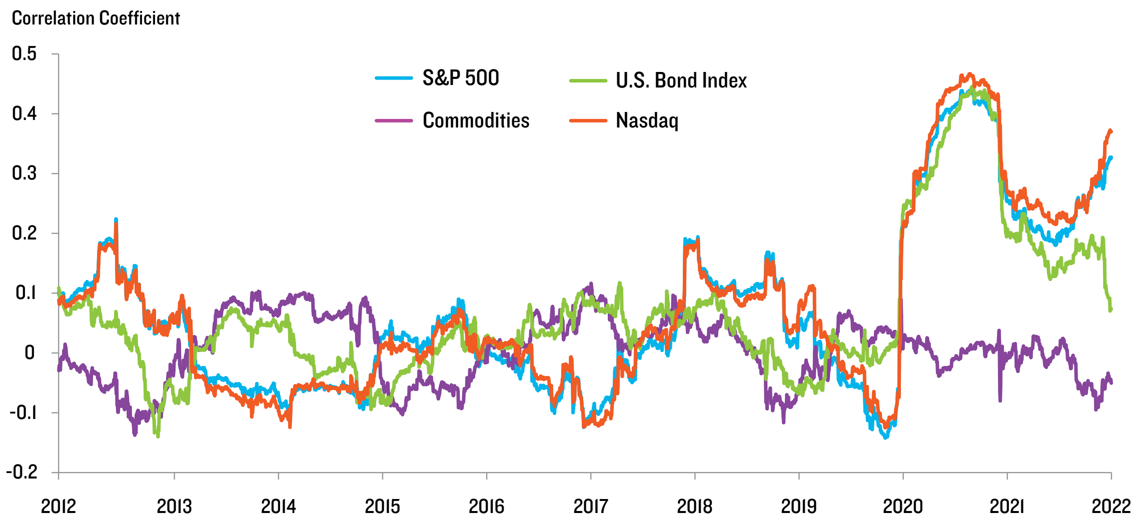
4. Is bitcoin a safe-haven asset or "digital gold"?

Bitcoin's deliberate detachment from financial institutions, central banks and monetary debasement leads some to believe it may be "digital gold" – that is, it retains its value during turbulent times. But during the COVID-related market drawdown in early 2020, for example, many markets collapsed, and bitcoin did not exhibit safe haven characteristics at that critical time while gold held its value throughout.

5. Is bitcoin supportive of ESG objectives?

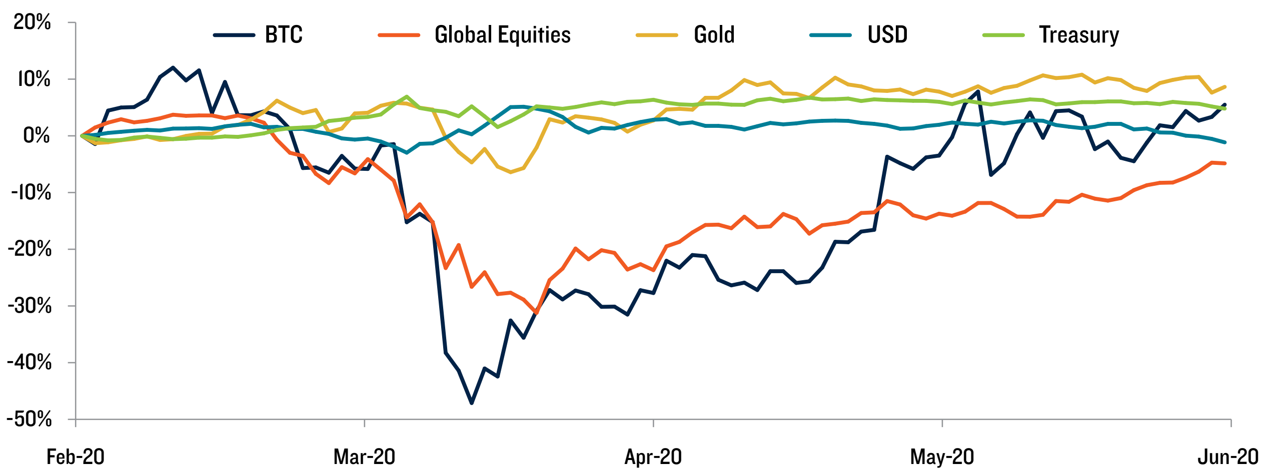
For sustainability-minded investors, cryptocurrencies are problematic along multiple dimensions of ESG. Bitcoin's carbon footprint is substantially higher than other payment networks. While cryptocurrencies are developing protocols to be more energy efficient, they raise concerns from a governance perspective, e.g., the anonymity of transacting makes it a preferred instrument in illicit activity – such as skirting sanctions.

Exhibit 2: **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.

Exhibit 3: **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.

Investment Opportunities in the Ecosystem

In contrast to direct cryptocurrency ownership, the broader blockchain ecosystem provides long-term investors with several attractive opportunities to evaluate. These include:

- **Private blockchains and smart contracts**

  Blockchains are a highly secure and robust system for verifying and recording transactions. Private applications of distributed ledger technology and smart contracts are being used in financial services, logistics and supply-chain management.

- **The infrastructure and broader ecosystem**

  The landscape for innovation in infrastructure is wide open, with tremendous potential to reduce current challenges and barriers. Companies solving issues around interoperability, due diligence, and fraud prevention might have a first mover advancement as the world of digital assets and central bank digital currencies matures.

- **Tokenization**

  Tokenization of real assets opens a simpler, more cost-efficient ways to manage and transact assets and investments. Once legal, governance and regulatory frameworks become settled this application will substantially reduce frictional costs across financial services and has the impact to reshape the current markets of illiquid assets.

THE PURSUIT OF OUTPERFORMANCE

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