

In Bitcoin We Trust?

Invented in 2008, Bitcoin made its trading debut in 2009 at a price measured in hundredths of U.S. cents. A year later, Bitcoin's price had risen to 8 cents, still small change but a massive percentage jump. It reached 67 cents in 2011, \$435 in 2015, peaked at over \$60,000 last year and now trades at under \$40,000 (Exhibit 1). The narrative surrounding Bitcoin has been every bit as hyperbolic as its price. Some see it as a new form of money free from government control that will displace fiat currencies. Others liken Bitcoin to digital gold and buy it as an inflation hedge. Criminals prize its anonymity as a way to hide ill-gotten gains. Some see it as a legitimate investment, while others buy Bitcoins like lottery tickets in the hope of getting rich quick. While Bitcoin's inventor claimed to be motivated by distrust of fiat currency, the mainly young, tech-savvy, men who dominate crypto trading appear more motivated by speculative gain than creating a new monetary system. This quarter's special topic assesses whether Bitcoin has what it takes to be money or a prudent investment.

EXHIBIT 1:

Bitcoin's Price Soars and Plummet

Sources: Coindesk. US\$ per Bitcoin. Data through June 2021.



Mining for Digital Gold

Money is nothing more than a social convention. Its form is immaterial and items accepted as money have taken many forms over the millennia, including shells, salt, furs, cocoa beans, cigarettes, gold, silver, base metals, notes and coins, and now bits and bytes. The key is its general acceptance as money, and that acceptance is based on trust.

Bitcoin's novel feature is the decentralized nature of its database of transactions. Its distributed ledger technology offers both relative anonymity and significant protection from the meddling of governments. In Bitcoin, trust is grounded in its technology.

When a Bitcoin user initiates a transaction, a "miner" updates the ledger to account for the transaction. The proof-of-work process to update the ledger is like mining for rare numbers via laborious

computations. Once the initial proof of work is complete, other miners and users can easily also update the ledger and verify that the transaction is valid. The proof-of-work process allows Bitcoin to maintain decentralized ledgers that all can trust as valid.

Market Implications of Increased Inflation

Unfortunately, the decentralized ledger also undermines Bitcoin's ability to perform the core functions of money – a means of transaction, a unit of account, and a store of value. Bitcoin is capable of processing only a handful of transactions per second, compared with Visa's capacity of 65,000 transactions per second. Unlike effective payments systems, Bitcoin suffers from diseconomies of scale. Direct transaction costs are highly variable and rise with the number of transactions.

Bitcoin is costly in other ways as well. Even at current low volume levels, Bitcoin's transactions consume the same amount of energy as Norway – 124 trillion watts per year. Bitcoin is also a profligate consumer of computing memory. Each transaction adds a few hundred bytes to the ledger, leading to exponential growth. The capacity needed to handle the volume of transactions regularly processed by Visa or Mastercard would quickly overwhelm networks.

Bitcoin is too volatile to serve as a unit of account and a store of value. Bitcoin's price volatility is a large multiple of major fiat currencies, stocks, and bonds, and can be as high as 30% per day. Bitcoin's extreme volatility casts doubt on its claim to be "digital gold" as well as its suitability as a prudent investment. Even a small amount of Bitcoin is capable of having a meaningful impact on the total return of a diversified portfolio.

Detractors of Bitcoin call it "dirty money", and not just because of its profligate energy use. At one point, it was estimated that up to 46% of Bitcoin transactions and one quarter of its users were involved in criminal activity. Criminal activity remains a significant source of demand for Bitcoin.

Ill-equipped to handle a large volume of transactions, rapacious in its energy and computer use, too volatile to serve as a unit of account, store of value, or prudent investment, and tainted by the whiff of illicit activity, Bitcoin seems a poor substitute for money and a potentially harmful component of a diversified portfolio. It also faces potential competition from central banks keen on developing their own digital currencies, likely based on a centralized ledger that will address Bitcoin's transaction volume constraints, high trading costs, high energy usage, and high computer memory demands. The motivation for central bank digital currency is diametrically opposed to the original vision of cryptocurrency as an anonymous type of money outside the purview of a central authority. It would be ironic if Bitcoin's ultimate contribution to the long and storied history of money were the creation of an efficient digital currency under central bank control that displaces the decentralized money its inventor envisaged.

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