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Bitcoin, Blockchain and the Future of Digital Currency

- Interest in bitcoin has grown as the cryptocurrency reaches new highs
- However, volatility, illiquidity and uncertainty undermine its value as a currency
- As an investment, the risks still outweigh the possible advantages
- Bitcoin's underlying technology, known as "blockchain," offers greater potential
- Private equity investments are the best way to capitalize on new technologies like blockchain

There are now more than 1,000 cryptocurrencies with a combined market capitalization of over $400 billion dollars.[1] In the grand scheme of things, they represent a relatively small portion of the global economy — U.S. equities, which represent about a third of the world's market capitalization,[2] have a combined market cap of roughly $25 trillion.[3] However, these alternative, digital currencies continue to generate a significant amount of buzz in the media and among investors curious about their potential.

At their core, these currencies provide an electronic payment system that enables paperless transactions from one person to another. The transactions are secured with cryptography (hence the name) and are entirely anonymous. Because cryptocurrencies are digital and direct, they bypass middlemen such as banks or credit card companies, and they do not have a central monetary authority.

Though bitcoin's potential as an alternative currency is what first garnered the public's attention, the future of digital currencies is still uncertain and quite risky. As bitcoin's price hits new highs, some investors have begun to wonder whether they can take advantage of this price momentum. However, we view a direct investment in bitcoin and other digital currencies as speculative. Instead, investors may want to seek out opportunities to take advantage of the underlying technology that powers bitcoin and other digital currencies, known as "blockchain," through investments in private equity.

The Power of Blockchain

Blockchain is a digital ledger that logs transactions in real time without the need for a single, centralized authority. In the case of bitcoin, transactions that take place on the network are compiled into "blocks," which are added to the chain in chronological order. Everyone who participates in the network has a copy of the blockchain, which contains a record of every transaction ever made, on their local computer. This distributed network of computers is used to validate transactions and prevent conflicts, tampering and duplication. By offering a secure and efficient method of exchanging and validating information, blockchain technology could have a tremendous impact on the global economy, with significant implications for the financial services, health care, real estate and consumer sectors.

[1] CoinMarketCap.com. As of December 11, 2017.
[2] "The Global Stock Market is Now Worth a Record $76.3 Trillion...," The Street, July 14, 2017.
[3] "U.S. Stock market Tops $25 Trillion," Seeking Alpha, January 27, 2017.

Blockchain technology has the potential to be more meaningful than the cryptocurrencies it powers over the long term. To explain why, we'll take a closer look at bitcoin.

How Bitcoin Works

Bitcoin's 2009 creation is shrouded in mystery. The true identity of its creator, who goes by the pseudonym Satoshi Nakamoto, remains unknown to this day. Bitcoins are produced through a process called "mining," in which participants in the network are awarded bitcoins as a reward for solving complex computational problems that help verify transactions and add them to the blockchain. Each bitcoin has both a private and a public key that enables secure trading, selling and spending.

Bitcoin represents about 60% of the total market capitalization of all cryptocurrencies. (The next largest cryptocurrency, Ethereum, represents another 10%.)[4] Its market cap puts it in the neighborhood of companies like McDonald's and 3M, and much of that value was gained in just the last year. Between January and December 2017, bitcoin's market cap rose from roughly $17 billion to a high of $276 billion.[5]

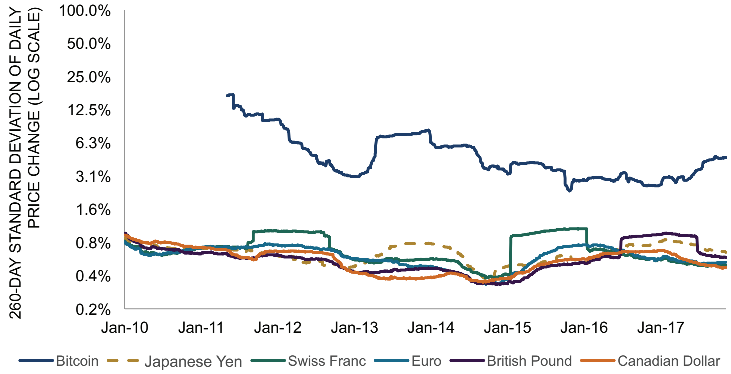
Bitcoin as Currency

As a means of exchange, bitcoin offers several advantages, including enhanced privacy, independence from country-specific monetary policies and substantial cost reductions for transactions. However, these advantages are more than offset by the risks presented by bitcoin's volatility and illiquidity, which make it a poor store of value, as well as the doubt surrounding its long-term viability.

Volatility

Volatility is a major obstacle to bitcoin's use as a currency. The price changes so frequently and so rapidly, it's impossible to know precisely what the purchasing power of your holdings is over any extended period of time. Bitcoin started 2017 at $997.72 and rose to $1,126.76 on January 4 — a change of almost 13% in just three days. By January 6, it had plummeted 21.6% to $883. That was the first of five separate 20% drops that bitcoin experienced in 2017, the most recent being a 25% drop that took place between November 8 and November 12, when it fell to around $6,000.[6] By the end of November, the price had risen again, to nearly $10,000. As of December 11, 2017, it was trading at around $16,000. Through the end of October, there were 12 trading days when the price of bitcoin rose or fell more than 10% in one day. The average standard deviation of bitcoin since its inception in 2009 is 5.2% — for other currencies over that same time period, it was less than 0.6%.

Exhibit 1. Bitcoin (USD) Standard Deviation of Daily Price Change (260-Day) Compared to Major Currencies



Source: Factset

Illiquidity

Though the level of attention bitcoin receives in the media may make it seem ubiquitous, the reality is that, as a currency, it is incredibly scarce. While trading bitcoin has become increasingly easy over time, most of it does not circulate in the real economy. Using it to buy things in common transactions is difficult, not just because it's not yet a widely accepted form of currency, but also because of the significant volatility. Consumers will be reluctant to spend them, as the value could spike significantly following the transaction; conversely, vendors may be reluctant to accept them, should their value plummet substantially after the transaction. Though some merchants are beginning to accept bitcoin, it's unlikely to become common unless it becomes less volatile and the threat of regulation diminishes.

By design, bitcoin has a finite limit — only 21 million bitcoins can ever be generated — and the mining process becomes more difficult and less rewarding as time goes on. It's projected that 94% of all bitcoins will have been mined by 2024; the very last bitcoin is expected to be mined sometime in the year 2140.[7]

Uncertainty

There are questions about bitcoin's long-term viability, related to internal, philosophical disagreements within the bitcoin community over the cryptocurrency's future. As bitcoin has grown in popularity and risen in price, transaction processing times and fees have also risen. Some bitcoin developers feel that high fees and slower transactions are stabilizing forces that give bitcoin more credibility as a store of value.[8] Others, however, don't see things that way, and have left the community to create their own offshoot, Bitcoin Cash. This new, entirely separate

[4] CoinMarketCap.com. As of December 11, 2017.
[5] Bitinfocharts.com. As of December 11, 2017.
[6] "Bitcoin Retains Its Crown as Crypto King...," Business Insider, November 13, 2017.
[7] "Controlled Supply," Bitcoin Wiki, Accessed December 11, 2017.
[8] "Bitcoin Plunges More Than 25% In Four Days," The Wall Street Journal, November 13, 2017.

cryptocurrency offers lower fees and faster processing times, but is otherwise identical to the original bitcoin. The emergence of Bitcoin Cash has not resolved the debate, however, and there may potentially be further splits as bitcoin continues to evolve.

Bitcoin offers no means of financial recourse for its users. There's no FDIC-style consumer protection for stored bitcoins. Losing one's private key means losing access to bitcoin assets, and there's no way to recover it. For example, tech writer Campbell Simpson purchased 1,400 bitcoins for $25 in 2010 and kept them stored offline, on a hard drive. He later disposed of the hard drive without backing up the data on it.[9] Without the hard drive, those coins — and the value they represent — are lost forever. As of December 2017, those bitcoins would be worth over $23 million.

There's also no telling how regulation might impact bitcoin and other digital currencies in the future. Following the June 2015 introduction of the BitLicense in New York, which introduced regulations for bitcoin exchanges, as many as 10 cryptocurrency startups ceased doing business in the state.[10] As of January 2017, only three BitLicenses had been granted.[11] In September 2017, China announced that it was banning all bitcoin exchanges from operating in the country.[12]

Though bitcoin's role as a currency may someday be feasible, the volatility, illiquidity and uncertainty it carries make it a risky proposition.

Bitcoin as a Speculative Investment

What about bitcoin's potential as a direct, speculative investment? In our view, the risks again outweigh the possible advantages. And, perhaps most importantly, some of bitcoin's theoretical advantages are already past their prime. The rapid acceleration of bitcoin's price has led some, including Warren Buffet, to wonder whether we are witnessing a bubble.[13]

Even taking Bitcoin's tremendous volatility into account, with no government authority behind Bitcoin to exact taxes — thereby creating reserves and subsequent value — the risk of making the incorrect call is very high. Should Bitcoin's volatility stabilize and its price become more predictable, the currency's pre-set limit for new coinage creation would still create valid concerns about its long-term value.

Furthermore, as bitcoin emerges from the dark corners of the internet and finds its way onto safer, more traditional exchanges, its value may encounter downward pressure from traders who are now able to bet against it. And the ability to trade futures could exacerbate the cryptocurrency's volatility even further.[14] In December, both the Chicago Board of Exchange and CME Group began to offer bitcoin futures.[15]

The Transformative Potential of Blockchain

While we do not recommend bitcoin as a direct investment, the emergence of blockchain technology creates a range of opportunities that are worth considering:

Changing the Nature of Global Business Costs and Competition

By eliminating transactional and foreign exchange costs, blockchain could level the playing field for smaller consumer companies, enhancing their competitiveness. Similarly, it could reduce or dilute the influence of major economies by devaluing their currency.

Transforming the Financial Sector

The growth of peer-to-peer transactions without a middleman could create major challenges for consumers, payment processors, financial institutions and markets. Companies such as Visa and MasterCard, for instance, have only just begun to consider how digital currencies might fit their business models. Both have invested heavily in blockchain technology in the hopes of leveraging the technology's speed and efficiency.[16, 17]

Accelerating Digital Innovation

Some of the world's technology leaders are struggling to keep up with the accelerated pace of digital currency innovation. This could portend a near-term rise in M&A activity as tech giants acquire early innovators to rapidly leverage emerging technology platforms. In addition, investment opportunities may lie in the pooling of resources to mine the remaining bitcoins and/or improve the network's processing power. Or unanticipated applications may emerge — e.g., MIT's Digital Currency Initiative, which is exploring the use of bitcoin's underlying technology for business, civic and social benefits.[18]

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[9] "I Threw Away $7.6 Million in Bitcoin," Gizmodo AU, May 28, 2017.
[10] "Behind the 'Exodus' of Bitcoin Startups From New York," Fortune, August 14, 2015.
[11] "Bitcoin Exchange Coinbase Receives New York BitLicense," Coindesk, January 17, 2017.
[12] "What China Ban?" Forbes.com, September 28, 2017.
[13] "Why Buffett Sees Bitcoin Bubble," Forbes.com, November 6, 2017.
[14] "Bitcoin Storms Wall Street," Barron's, December 2, 2017.
[15] "CBOE and CME Battle for Bitcoin Futures Bragging Rights," Financial Times. December 4, 2017.
[16] "Visa Dodged Bitcoin, Embraces Blockchain," San Francisco Chronicle, April 10, 2017.
[17] "MasterCard Will Now Let You Pay With Blockchain—But Not Bitcoin," Fortune, October 20, 2017.
[18] https://www.media.mit.edu/groups/digital-currency-initiative-dci/overview/

Influencing Investment Strategies

The reduction or transformation of barriers to business, trade and global economic growth may influence not only currency investing, but also investment opportunities worldwide. Impacts on the financial and technology sectors represent probably the nearest term — but not the only — opportunities. In the end, the effects of blockchain technology may be felt throughout the global economy.

Conclusion

At BNY Mellon, we are committed to assessing the evolution of digital currency (including its near- and long-term outcomes) and its potential impact on markets, asset classes and individual companies. Throughout our organization, these virtual currencies and their underlying technologies are being evaluated from multiple perspectives. Our analysis is comprehensive, with a goal of leveraging these advancements to meet the investment needs of clients and other financial market participants. We are an active member of six consortiums that are focused on bringing blockchain to the financial services industry, including R3, Utility Settlement Coin and Hyperledger. We also took a leadership role in the creation of the Enterprise Ethereum Alliance, which is the largest open-source blockchain alliance in the world.[19]

For now, however, digital currencies remain in their infancy and interested investors should proceed with caution, assuming a broad, long-term view. The best way to capitalize on technology adoption acceleration, like the internet, social media and other disruptive technology, is through private equity.

Bitcoin has proven that digital currency is possible in some form, however unpredictable its future may be. As with many new innovations, a more mature form of the disruptive technology may ultimately surpass its original intent.

[19] "The Enterprise Etherium Alliance Just Got a Whole Lot Stronger," Inc., July 19, 2017.

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