



Bradley, Foster & Sargent, Inc.

Quarterly Market Commentary

January 2018

A Primer on Bitcoin: Bubble or Bonanza

Bitcoin won't end well. It is a fraud and worse than tulip bulbs.

Jamie Dimon, Chairman,
J.P. Morgan, September, 2017

Blockchain technology isn't just a more efficient way to settle securities – it will fundamentally change market structures – and maybe even the architecture of the Internet itself.

Abigail Johnson, Chairman and CEO,
Fidelity Investments, May, 2017

It is difficult to pick up a newspaper these days or go online without running into an article about Bitcoin (in this commentary, we will refer to Bitcoin as the rubric for the hundreds of other cryptocurrencies which have been launched recently). Over the past year, many speculators have been willing to invest in almost anything related to virtual currencies. The huge amount of interest in and real excitement about Bitcoin has all the trappings of a mania – a huge speculative bubble. And we have seen this movie before during the dotcom bubble in the late 1990s, before the bubble burst. In the period 2000-2002, the NASDAQ dropped 78% from peak to trough. Others say that the Bitcoin craze is more like the tulip bulb mania in Holland in the 1630s, when tulip bulbs were traded on the spot and futures market in Amsterdam, and the price of some tulip bulbs went up five and tenfold in weeks – only to lose 99% of their value shortly thereafter. The chart below shows the price of one bitcoin over the past year:

**Price of One Bitcoin
1/2017 – 1/2018**



Source: CoinDesk

Is this Bitcoin mania just another example of the type of giant speculative bubble described in Charles Mackay's classic book, *Extraordinary Popular Delusions and the Madness of Crowds*, or is something more happening this time? While there are many naysayers, some in the investment

community believe that Bitcoin fulfills an important economic and political need and that cryptocurrencies are only in the first inning of the game. Not a few of our clients are asking us about Bitcoin and whether it is an appropriate investment for them. Accordingly, this investment commentary is intended as a primer on Bitcoin. The main purpose of this primer is to explain what Bitcoin is and the underlying blockchain technology on which it is built. It is also to make an assessment of Bitcoin as an investment. The Bitcoin story is actually very complicated, and it is a fair bet that most retail speculators, of whom there are now many, do not fully understand how Bitcoin works. On the following page, we have compiled a glossary of terms to help readers understand Bitcoin and its underlying technology.

The Creation of Bitcoin

In November, 2008, Satoshi Nakamoto published an academic paper: *Bitcoin: A Peer-to-Peer Electronic Cash System*. The system was launched in January, 2009. Nine years later, the actual identity of Nakamoto – whether a person or a group – is still not known. Nakamoto’s anonymity is seen by some as a drawback to Bitcoin, and for others, his anonymity and that of the system is one of the most attractive aspects of Bitcoin. Nakamoto wrote in 2008: “What is needed is an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party.” The concept of Bitcoin and other cryptocurrencies took considerable time to catch hold. At the end of 2013, the total value of all bitcoins stood at around \$1 billion. At the moment, the value of Bitcoin and the hundreds of other cryptocurrencies is more than \$250 billion.

What is Bitcoin?

Bitcoin is a virtual currency (meaning that there is no actual coin that you can touch). Bitcoin replaces the physical item with a computer file. To own a bitcoin, one must buy it from an owner or mine it (more about mining later). When one owns a bitcoin, it goes into a digital wallet which the owner creates online. The smallest transaction unit is one hundred-millionth of a bitcoin, a unit called a *satoshi*. Every single bitcoin transaction that has ever taken place is recorded on a decentralized network of computers that operate globally on open source software. This network of computers is called a distributed public ledger. It utilizes blockchain technology. Each operator of a computer, or a node, can verify any transaction, as every change or addition to the ledger is copied and sent to all participants. The ledger is permanent and visible to the entire network of computers. Rather than relying on a single recordkeeper like a bank or payment system like Visa, Bitcoin relies on a distributed public ledger maintained by nodes (computers) all over the world. Validation of each bitcoin transaction is difficult to do, and those who are able to do it are rewarded for doing so by being allowed to create bitcoins in a controlled way (mining). When the original software and protocol was created, it allowed for an absolute maximum of 21 million bitcoins. As of this month, there are 16.7 million in circulation.

How are Bitcoins Mined (Created)?

To understand how bitcoins are mined, it is best to envisage a transaction where Liz is the owner of a bitcoin, i.e., a string of zeros and digits stored in a wallet (an encrypted computer file) that is

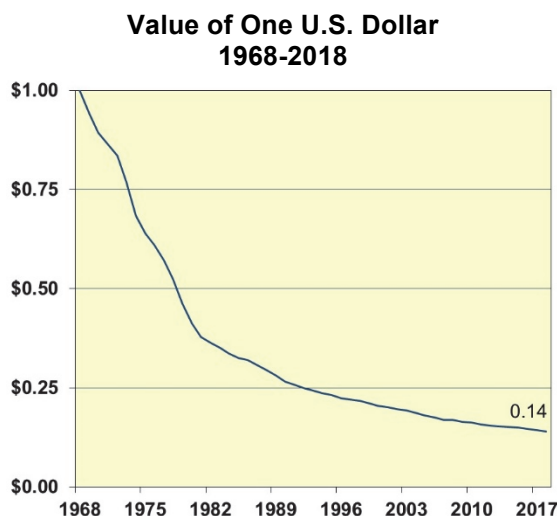
A Glossary of Terms

Blockchain Technology	A distributed public ledger (electronic exchange platform) that jointly manages the database that records all bitcoin transactions based on open source software records. Blockchain operates across a network of linked but independent computers, allowing two people or entities to exchange value directly without a middleman such as a bank or a government.
Bitcoin Protocol	Original algorithm that rules how Bitcoin works and regulates the issuance rate of new bitcoins that come into circulation, limiting the issue of bitcoins that ultimately come into circulation to 21 million.
Bitcoin Mining	New bitcoins come into circulation in return for computing efforts to encrypt and record the transfer of ownership of bitcoins in the distributed ledgers by solving a complicated mathematical problem.
Bitcoin Cash	A Bitcoin spinoff currency that trades at about one-fifth the value of the original bitcoin but allegedly has an advantage of faster transaction time with much lower transaction fees than Bitcoin.
Bitcoin Wallet	A wallet that is an encrypted computer file managed by an application that is installed on a computing device. It acts like a bank account and is a place for the owner to store bitcoins digitally.
Bitcoin Key	A secret alphanumeric string that allows bitcoins to be spent and received. A Bitcoin wallet provides the key. An analogy would be a user name and password for a brokerage or bank account.
Cryptocurrency	A virtual currency, one of whose key features is using encryption for security. A virtual currency is independent of government or any other centralized authority, enabling anonymous transactions and safety from taxation and confiscation by a state.
Distributed Public Ledger	A database that is consensually shared and synchronized across a network spread across multiple sites. It allows transactions to have public “witnesses,” thereby making a cyberattack more difficult. Each node (a participant with computing power) of the network can access the recordings shared across that network. Further, any changes or additions made to the ledger are reflected and copied to all nodes. Underlying the distributed ledger technology is the blockchain, which is the technology on which Bitcoin runs. Some cryptocurrencies such as Ripple are not based on a distributed public ledger but are centralized on one company’s computer.
Initial Coin Offering (ICO)	A fundraising technique for new blockchain-related projects. An investor exchanges existing cryptocurrencies such as Bitcoin for new virtual coins and/or company stock; it is a cheaper and more flexible way to raise money than an IPO.

managed by an application that she has installed on her computer. She wants to transfer the bitcoin to Peter, who also has a wallet managed by an application. The two applications carry out the transaction (ensuring its safety through the use of public and private keys, i.e., similar to passwords). Then the applications broadcast a message to a large network of nodes on the Internet, announcing the proposed transaction between the two wallets. Every few minutes, the nodes, called “miners,” gather up the proposed transactions that were recently broadcast and attempt to add them to the “blockchain” or the universal public ledger. However, it is not easy to validate Liz and Peter’s transaction, for Bitcoin’s software protocol requires a “proof of work.” This is accomplished by solving a difficult mathematical problem called a *hash*. This can be costly as it requires computer hardware, time, and electricity. The amount of electricity needed to solve these problems has grown exponentially to such an extent that the *Wall Street Journal* reported recently that Bitcoin “mining” uses the same amount of electricity daily as Denmark, a country of 5.7 million people. The first “miner” to find a solution broadcasts it to the other miners who verify it (a majority of nodes need to agree). The miner who solved the problem is rewarded for the effort with bitcoins.

Why has Bitcoin Attracted so Much Interest?

Bitcoin is a virtual currency that is independent of government or any other centralized authority. It enables anonymous transactions and safety from taxation and confiscation by the state. There are several groups of people who find this enormously attractive. The first are those who are very distrustful of the intrusive power of the state and often with good reason. The last century is rife with examples of communist, socialist, and totalitarian governments across the globe confiscating wealth and expropriating private property. There are also wealthy individuals and families in America and Western Europe who are increasingly fearful of the unchecked power of their own democratic governments (the deep state). Bitcoin’s anonymity and independence from any central authority is very appealing to this group. The second group of people who are attracted to the concept of Bitcoin are people who fear the debasement of their own country’s currency. Bitcoin appeals to them because, like the scarcity of gold, there is only to be a finite quantity of bitcoins ultimately issued – 21 million units. The chart below shows how inflation has eroded the value of the U.S. dollar over the past fifty years so that \$1.00 in 1968 is worth \$.14 today:



Another group that is drawn to Bitcoin are those who believe that the blockchain technology which underlies Bitcoin has significant applicability in the world of finance and law. Chairman and CEO of Fidelity Investments, Abigail Johnson, who is quoted at the beginning of this piece, is only one of a growing number of corporate executives who believe that blockchain technology has a real future. Finally, there are those state and private actors who wish to launder money or make transactions anonymously, and Bitcoin is a perfect solution for them.

Potentially Negative Features of Bitcoin

Like fiat currency, Bitcoin has no intrinsic value. Its value depends upon the willingness of others to accept it as a medium of exchange and value. Bitcoin's promoters say that this is no different from the currencies of most nations which issue fiat money – money not backed by gold or silver or any other valuable commodity. This is true, except countries issue legal tender that can be used to repay a debt or a public obligation such as a tax. No government accepts bitcoin for taxes, and none are likely to do so, for it would lose control of the regulation of the money supply and also cede its governing authority, as expressed in its monopoly on legal tender.

Bitcoin is not well-suited as a payment mechanism for several reasons. The value of Bitcoin on the various markets on which it trades fluctuates 3-5% on most days, and occasionally as much as 40%, which happened last month between December 19 and 22. How can a seller of a service or a good accept payment in a currency whose value is so uncertain from day to day? Another problem is that processing a transaction between one bitcoin wallet and another can take a long time – as much as 30 minutes or longer. This would create enormous processing bottlenecks if bitcoins were widely used to pay for goods and services.

Another negative feature is the danger of hacking. There have been numerous cases of hackers successfully invading bitcoin exchanges and wallet providers, stealing significant amounts of bitcoin. Because the underlying technology is based on the Internet platform, hacking is a problem, and one of the only solutions for a bitcoin owner is to maintain the wallet data on a computer not linked to the Internet (cold storage).

An additional problem for Bitcoin involves the enormous use of electricity needed to power the computers that are used to mine bitcoins. As described above, every transaction needs to be verified by the distributed public ledger, and as new computers join the network, the system is designed to require more and more computing power to solve the hash for each transaction – the mathematical problem which verifies that a specific transaction is legitimate and properly recorded in the blockchain. Apparently some of the biggest mining operations are in Iceland because the low cost of electricity gives miners there an advantage.

Perhaps the single biggest risk for investors is the possibility and even likelihood of government regulation. China has already cracked down on Bitcoin exchanges and banned the trading of cryptocurrencies, and recently, apparently closed down many of the large mining operations in the country. Last month, South Korea also took steps to limit trading of Bitcoin, and has forbidden the use of anonymous accounts opened on Bitcoin exchanges. The threat of the U.S. government or other governments in the developed world banning Bitcoin or introducing

stringent regulation to limit its growth is a real one, which should give investors pause before taking large positions in Bitcoin.

How to Invest in Bitcoin and Similar Entities

As a matter of interest, there are a number of ways to speculate in Bitcoin and other similar investment vehicles. **We, at Bradley, Foster & Sargent, are in no way recommending any of these securities or quasi-securities.** But it does appear as if the Bitcoin phenomenon may have legs and will be part of the financial world for some time to come, and thus it is useful to describe how speculators are taking positions in Bitcoin:

1. Digital Wallet: Open a digital wallet at Coinbase.com, which will require entering a credit card number or bank account number on line, in order to purchase Bitcoin and other leading virtual currencies such as Ethereum, Ripple, and Litecoin. Through Coinbase, one can buy, store, and sell Bitcoin. There are many digital wallets that one can use but Coinbase is both a wallet and an exchange, which simplifies the process. Fees of up to 4% may be charged depending on the transaction. One is required to create a user name and password. One can also open an account at an exchange such as Binance, but this is merely an account, not a digital wallet. This approach may be simpler to operate but opening a wallet is more secure than leaving virtual currencies on an exchange which can more easily be hacked.
2. Bitcoin ETF: Purchase shares in Bitcoin Investment Trust (GBTC). GBTC is an investment vehicle which buys and holds bitcoins. It is an exchange-traded fund (ETF), and each share of this ETF represents .0919 bitcoin. The ETF is a passive investment vehicle like the SPDR Gold Trust ETF, which has no cash, no leverage, and no assets other than Bitcoin. Because it is one of the only ways that retail investors can own Bitcoin, the share price often trades at a 50% or greater premium to the value of the bitcoin in the trust. In December, the shares traded between a low of \$1,155 and a high of \$3,523. The chart below shows GBTC's volatility during 2017:



Source: Bloomberg

3. Futures Market: Both the Chicago Board of Options Exchange (CBOE) and the Chicago Mercantile Exchange (CME) have introduced futures products. Neither of the products involve delivering actual bitcoins when the trades settle. Traders pay or receive cash at the termination of a contract. The CBOE contract (XBT) is based on one bitcoin which, as this goes to press, is worth approximately \$11,600. The CME product (BTC) is based on five bitcoins so one contract is worth around \$58,000. Leverage is not allowed so the investor has to put up the entire value of the contract. There has been very modest trading in the CME product thus far as retail investors generally like to use leverage, and therefore they are generally not willing to put down \$58,000 to buy a single contract.

4. Equities of Bitcoin-Related Companies: Over the past year, a number of companies have changed their business model to become involved in providing services to Bitcoin-related companies or in trading cryptocurrencies. An example is Overstock.com, a company which offers an online shopping site. In June the stock was trading around \$20 per share. Several months ago, it announced that it is launching a subsidiary, tZero, which will focus on blockchain technology. The stock traded recently at \$85 per share. This appears suspiciously like the dotcom bubble, when the stock of any company which announced it was creating an online business and website, would zoom up tenfold or more. In addition to Overstock, there are other companies such as Riot Blockchain and LongFin, the stock prices of which have risen exponentially after announcing that they were getting involved in blockchain. More companies will surely be announcing their new Bitcoin business model. *Caveat Emptor!*

Bonanza or Bubble?

There is no doubt that for those who invested in Bitcoin several years ago or longer, it has been a bonanza. In late 2013, the average worth of a bitcoin was around \$100. At the beginning of 2017, a bitcoin was valued at around \$1,000. Today it trades for nearly \$12,000. Bitcoin rose seventeenfold in one year and is up 170 times in four years. Early investors in Bitcoin have made a killing in it. Bill Miller, the superstar money manager who managed to outperform the S&P 500 for fifteen years in a row ending in 2005, said in an interview last December that his position in Bitcoin at the time was “just about 50%” of his hedge fund. He bought Bitcoin in his hedge fund in 2014 and 2015 for an average price of \$350. At the time it represented about 1% of the fund’s assets. Having appreciated almost fiftyfold since then and having not sold any of his position, it represented almost 50% of his fund. Miller also was quoted as saying, “There is a nontrivial chance that it [Bitcoin] goes to zero.” Other well-known investors in Bitcoin include the Winklevoss twins, who invested \$11 million in 2011; their investment is now worth more than \$1 billion. Peter Thiel, the cofounder of PayPal who famously was the first outside investor in Facebook, invested \$15-20 million in Bitcoin within the last several years and has also profited handsomely.

The question, however, is what happens going forward? Does Bitcoin have merit as an investment over the next several years, or are we witnessing just another mania like the “tulip bulb” or dotcom bubble? Can Bitcoin be considered a speculative investment or is buying Bitcoin just gambling? And finally, is a minimal stake in Bitcoin suitable for any of our clients?

Bitcoin has captured the imagination of many investors because they see it as an answer to some of their greatest fears. As mentioned above, the fear that the state can and will expropriate or confiscate

one's property is very real. Perhaps the majority of citizens in the world have been through civil wars, revolutions, war, and government mismanagement which has resulted in the loss of their private property and their wealth. Others in South America, Africa, Asia, and even Germany have seen their wealth destroyed by rampant inflation. If you combine these fears with the enormous amount of liquidity provided by central banks over the past several decades, one can see the origins of this speculative bubble. However, because these fears may be justified by past government behavior, it is quite possible that Bitcoin, unlike other manias, might have a more enduring future. In our view, the most likely reason for the bubble to be burst is the likelihood of regulation by governments and central banks which will increasingly see Bitcoin and other cryptocurrencies as a threat to their own currency and, ultimately, their country's sovereignty.

Many speculators who are currently buying Bitcoin are indulging in the "Greater Fool" theory of investing. This theory leads investors to believe that it is possible to make money buying an overpriced security and selling it at a profit to a greater (or bigger) fool who is willing to pay an even higher price. This approach works until the bottom drops out of the market, and then things end badly for them. Bitcoin is not an investment. It is not even a speculation. It is a pure gamble, as there are no underlying assets or cash flow.

For those whose imagination is captured by Bitcoin and who want to have some of the action, we believe that investors should view any money used to purchase Bitcoin and similar vehicles in the same way as money used to gamble in Las Vegas. One should be prepared to lose every penny of it. Merrill Lynch has wisely acted, in our view, to block their clients and financial advisors who trade on their behalf from buying Bitcoin, citing concerns over the cryptocurrency's suitability. At Bradley, Foster & Sargent, we are investors, not speculators or gamblers. And since our inception nearly 24 years ago, our investment approach of investing in quality stocks for the long haul, with careful attention to risk, has served to preserve our clients' capital in times of economic adversity and increase it in times of prosperity.

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