

Bitcoin: Should plan sponsors consider it for retirement plans?

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You can't pick up a newspaper or open a website these days without seeing an article about bitcoin. It's a currency of extremes. Its price has gone up 20 times over the course of the year, but it has also declined 25% in one day. That happened on December 22 and it has been struggling so far in 2018. Has the recent decline in bitcoin values created a buying opportunity for plan sponsors? The technology that underlies bitcoin and other cryptocurrencies, blockchain, is an emerging software solution and will likely have many practical applications, as we'll discuss. But bitcoin seems to be an answer in search of a problem, and at this moment the problems it seems to solve most effectively are illegal drug trades or hackers demanding ransom.

This article addresses bitcoin and whether it is an appropriate investment vehicle for retirement plan sponsors. To note, cryptocurrencies such as bitcoin rely on blockchain technology; these are distinct concepts and should be viewed separately when considering retirement investment opportunities. Blockchain is a decentralized public ledger of transactions or data. It is a growing collection of data without a recordkeeper or regulator. Blockchain is composed of cheap, automated

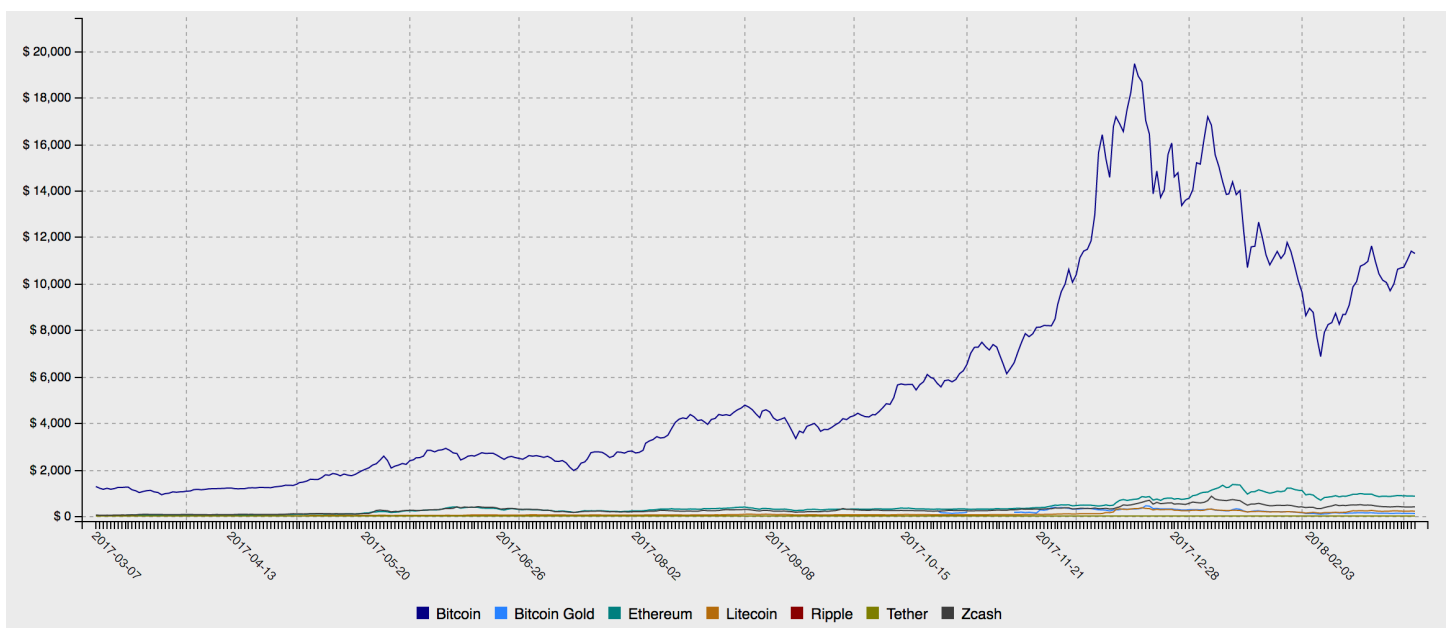
data structures, and the potential for this technology is being explored by large institutions, banks, software companies, and other businesses that need secure data.

Bitcoin is a digital "currency" or cryptocurrency not tied to a sovereign or bank. As of December 6, 2017, there are currently 1,200 cryptocurrencies. Bitcoin is the largest and most well-known of them, representing about 60% of the \$380 billion market. But how does bitcoin work and is it ready for institutional investors like pension and 401(k) plans? First, let's answer a few basic questions.

How does bitcoin work?

Bitcoin, as a cryptocurrency, is not backed by any government, commercial institution, or identifiable or measurable asset or commodity. It is a digital promise backed by encryption and passwords. Fans of cryptocurrencies like them because of their limited supply. Gold and diamonds are created in a natural process and their supply is likewise limited. When a government needs more money, one of its options is to print it,

FIGURE 1: CRYPTOCURRENCY CHART



Source: Cryptocurrency Chart, as of March 5, 2018: <https://cryptocurrencychart.com>.

thereby increasing the money supply. The number of bitcoins is governed by the blockchain technology that underlies its use. The software determines the number in existence. Bitcoins “grow” at a scheduled amount. There were about 15 million at the beginning of 2016 and 16.8 million in the middle of January of this year, adding about 700,000 each year. Because there is a maximum number of bitcoins that will ever be mined (capped at 21 million), the system can be free of inflation. Most users are anonymous and price is determined solely by supply and demand. Unlike gold, seashells, or paper bills, cryptocurrency doesn’t physically exist. Bitcoins are not “anchored” to some value: gold and silver have industrial uses; cash has to be accepted by the government to pay taxes. Even in a cashless transaction-like barter, you’re exchanging two items that have some practical value. Dollar bills are backed by the U.S. government; cryptocurrencies are valued based on supply and demand, which can be driven by sentiment, greed, and fear. Thus, there can be huge price swings, booms, and busts.

How is bitcoin used?

Bitcoin is primarily a tool for transactions (purchase of goods, payment for services) and trading. Recently, Goldman Sachs announced that it will be launching a trading desk this year, suggesting increasing confidence in the market, and most likely an opportunity for trading desk profit. In December, the Chicago Board Options Exchange, the largest options exchange in the United States, began trading futures against bitcoin. The Chicago Mercantile Exchange has followed suit. Early investors have made money in cryptocurrencies so far.

Blockchain: The technology behind bitcoin

The encryption that makes the “coins” possible is called blockchain technology. Cryptocurrencies are lines of computer code that are edited (time-stamped) as they travel from one owner to the next. This computer code is stored on databases all over the internet that are reconciled against each other. If a change is made that doesn’t synchronize with all the duplicate files around the world, the transaction is not valid. An example might be: imagine everyone was always looking at everyone else’s bank accounts and transactions. If one person said a transaction took place and no one else saw it, it wouldn’t count. That’s what “bitcoin mining” is: other computers verifying the encrypted, anonymous transactions, using mathematics to find a consensus among bitcoins’ users.

Bitcoin mining is also used to create the currency. If “miners” can solve very complex math “puzzles,” they can create bitcoin currency. This is why so many people and businesses are committing capital to computer farms in order to mine for coins. This blockchain structure was established when the cryptocurrency was created in 2011.

Who is using bitcoins now?

Bitcoin is most popular with people and institutions on the leading edge of technology, and a number of large investors, rather than the everyday consumer. To use bitcoin, you need a “wallet” (a place to store your bitcoins) and an exchange (a place to buy and sell your bitcoins). Transactions can be made anonymously, which makes the cryptocurrency susceptible to illegal activities. Computer hackers who hijack your computer and demand a ransom frequently require payment in bitcoin and other cryptocurrency because it’s anonymous and untraceable. Individuals who might be afraid of governments’ abilities to print money and inflate their currencies might use bitcoin as a store of wealth because the supply is not subject to dilution.¹

Very few businesses currently accept bitcoin or other cryptocurrencies as payment, but cryptocurrencies are being used by a small number of companies and may be used more often in the coming years. Currently, bitcoin payments are accepted at Microsoft, Dell, Dish Network, Overstock.com, and Newegg, among other companies. However, as of early January, a number of wirehouse firms have decided not to continue selling the cryptocurrencies on their platforms. The Wall Street Journal reports that Merrill Lynch no longer allows clients access to the bitcoin futures market,² while other outlets report that Morgan Stanley, UBS Americas, and Wells Fargo Advisors have all moved to stop new sales of bitcoin futures and trusts linked to the cryptocurrency.³

With a limited supply, the price of bitcoins will adjust based on demand. Will that continue to grow as it has recently, or will the increase in the number of cryptocurrencies or the lack of confidence in their abilities to store value result in declining demand over time? For plan sponsors, these are important questions.

Bitcoin and institutional (retirement plan) investors

How does bitcoin fit in with the goals of plan sponsors? One of the requirements of retirement plan fiduciaries is to remain diligent, looking for ways to earn return and protect capital in a prudent manner. Pension plans are looking for ways to add return while controlling risk, frequently through asset classes

- 1 O’Brien, M. (January 8, 2018). Bitcoin is teaching libertarians everything they don’t know about economics. Washington Post. Retrieved January 24, 2018, from https://www.washingtonpost.com/news/wnk/wp/2018/01/08/bitcoin-is-the-new-middle-ages/?utm_term=.c243a67edf31&wpisrc=nl_az_most&wpmk=1.
- 2 Beilfuss, L. (January 3, 2018). Merrill Lynch bars trading of bitcoin fund, futures. Wall Street Journal. Retrieved January 24, 2018, from <https://www.wsj.com/articles/merrill-lynch-bars-trading-of-bitcoin-fund-futures-1515016825>.
- 3 Levoux, J. (January 4, 2018). Wirehouses say no to bitcoin. ThinkAdvisor. Retrieved January 24, 2018, from <http://www.thinkadvisor.com/2018/01/04/wirehouses-say-no-to-bitcoin?&slreturn=1515168613>.

that offer diversification and attractive risk-adjusted returns. And 401(k) plan fiduciaries are looking for the same thing to offer their plan participants the ability to build their own portfolios using instruments they can evaluate and understand.

When plan sponsors look to commit capital to an asset class, they demand a certain amount of information, transparency, and trust. No matter how attractive the historical return, plan sponsors and trustees must behave as prudent fiduciaries. Does bitcoin fit into this framework? Let's examine a few issues:

- **Capital preservation:** Fiduciaries need to know the expected upside of their investments and the chances for loss of capital. Because cryptocurrency cannot be held and only exists as a few lines of computer code, the chance of it vanishing completely would be a concern to a plan sponsor who must have assets independently in the custody of a trust company. Even if a sponsor could be assured bitcoins are safe, their value is based on demand-driven price. One or two sizable thefts or the failure of a key bitcoin broker and demand could plummet, significantly diminishing the value of the plan sponsor's holdings.
- **Expected return:** Investors buy assets to generate returns, with dividends and interest or an increase in price. Frequently they will examine historical returns and risk premia. Bonds are owned to collect the interest payment, stocks to earn the dividend and potential capital growth, and gold because its price typically increases as inflation goes up. Return-since-inception for bitcoin is certainly attractive. It's currently unclear how bitcoin's future return would be modeled. Bitcoin doesn't pay interest (though some cryptocurrencies do pay implied dividends), so the only source of earnings is a price increase. The expectation would have to be for increasing demand for a stable supply, a broader adoption as a medium of exchange. With new cryptocurrencies coming online, it's hard to know how to measure this future supply/demand equilibrium.
- **Asset classes:** While bitcoin's returns look attractive, it also would seem to provide diversification. Plan sponsors are usually looking for asset classes that help their risk adjusted returns: a higher Sharpe Ratio. The most similar asset class might be gold. It doesn't earn a dividend and it is difficult to establish physical custody. Some institutional investors will own physical gold and store it in a secure facility. Most will own a derivative (futures contract) that has a value based on physical gold. Cryptocurrency cannot be held in custody like gold and it does not have any other use (industrial, jewelry, etc.). Gold, while not as portable as bitcoins, has a worldwide market. And while cryptocurrencies can be bought and sold quickly, converting them to other asset-classes is not as easy as many other plan sponsor holdings. In times of global distress or market corrections, it will likely be even more difficult.
- **Valuation:** Owners of assets want to know what their holdings are worth. Investors purchase assets, hopefully at a discount to future value, expecting them to go up. It's unclear what the "value" of a bitcoin is because it's not anchored to a purpose like dollars, euros, platinum, silver, etc. Federal Reserve Chair Janet Yellen called the cryptocurrency a "highly speculative asset," saying it is not a stable source of value, and it doesn't constitute legal tender.
- **Intrinsic value:** One of the biggest challenges of bitcoin is its intangible nature. As a social construct, the cryptocurrency holds value. But unlike gold and dollar bills, which have physical representation, or stocks and bonds, which represent ownership of a business entity, bitcoin has no material representation. How does an investor compare the value of bitcoin against monero, Zcash, Ripple, or many of the other digital currencies when there are no earnings, assets, or other typical valuation metrics?
- **Custody:** Plan sponsors have to be able to know they own a particular asset and can value it in an accurate and timely fashion. Auditors need to see the asset and see that it is available to pay benefits or expenses. Many asset classes, including stocks and bonds, could be subject to theft or fraud so the role of the custodian is important to establish ownership. Stocks and bonds held in an account can be priced and traded quite easily. Pension and 401(k) plan assets (stocks, bonds, funds, cash, real estate, etc.) are held in custody in a trust account. How do you establish custody for an asset that is only digital code and a password? There are "hard wallets" that are like USB flash drives as well as "accounts" with passwords. Ownership is only as secure as the password or the physical wallet. Because the trades are anonymous and untraceable, how secure is a simple password? With a hard wallet and a couple of keystrokes, an untraceable trade could wipe out a plan's account with no way to track down the offender.
- **Security:** Plan sponsors remain concerned about security and access. Identity theft is on the rise, with hackers attacking 401(k) plan balances and pension benefit payments. Cryptocurrencies remain a significant target for hackers and thieves.
- **Governance:** Because bitcoin exists outside the oversight of banks and regulators, it's hard to know how disagreements can be resolved. As an owner of a cryptocurrency, do you have confidence and trust in the governance of the rules of ownership and trading? If you have a grievance or feel you have been mistreated in a transaction, to whom do you seek relief? Further, the tax treatment is unclear and changes (for non-plan sponsors) could have a material impact. You may be at the mercy of whoever your custodian is—and that could be an anonymous account or a USB flash drive.

FIGURE 2: KEY DIFFERENCES AND BENEFITS OF ASSETS

	PROVIDE DIVERSIFICATION	EXPECTED RETURN	INTRINSIC VALUE	SUBJECT TO HACKING OR THEFT	LIQUIDITY	EASILY USED FOR ILLICIT COMPENSATION
STOCK AND BONDS	LOW	CONFIDENT	YES	NO	HIGH	NO
REAL ESTATE	BETTER	CONFIDENT	YES	NO	MODERATE	NO
GOLD	BETTER	MODERATE	YES	NO	HIGH	NO
CRYPTOCURRENCIES	PERHAPS	UNKNOWN	NO	YES	HIGH	YES

While bitcoin currently has challenges in the retirement plan space, blockchain technology has the potential to generate return for its adopters. Blockchain is not just used for cryptocurrencies—it is also used elsewhere. For example, the Australian Stock Exchange plans to start using blockchain to process equity transactions. Wal-Mart is testing it as a tool for food safety. Its use will likely grow in the financial sector and other industries and environments that need secure, audited, and verifiable data. Government and banking are two areas that could benefit. Plan sponsors look at a number of factors when investing in an asset class, such as whether it will provide diversification and whether an expected return with reasonable confidence can be prudently developed. The table in Figure 2 summarizes key differences and benefits between some common asset classes and offers speculative considerations for a typical institutional investor currently holding a diversified portfolio.

At this time, bitcoin and other cryptocurrencies are not appropriate for retirement plan sponsors. Other institutional investors, individuals, family offices, speculators, and even some aggressive hedge funds may see them as an opportunity, but plan sponsors should not yet consider them a distinct asset class. Institutional investors will likely own businesses that take advantage of blockchain technology, but at this stage of development, plan sponsors are not likely to own the cryptocurrency directly. It's this author's opinion that bitcoin isn't ready for plan sponsor prime time.

What needs to change to make bitcoin attractive for retirement plans?

Blockchain technology is already attractive as an investment opportunity. While not a distinct asset class, it will likely contribute to corporate earnings in a meaningful way—all of which is a topic for another paper. But what needs to change to make bitcoin attractive for plan sponsors? While not regulated by any bank or government agency, better oversight may lead to an environment that creates confidence in the pricing and exchange of bitcoin. Also, plan sponsors like to participate in markets with efficient ways to buy and sell risk. Broader

institutional market adoption such as futures, shorting, and opportunities to arbitrage might bring pricing efficiency and predictability that could make it an attractive asset class. As of this writing, these market forces are in the early stages of development, and expansion in this area will be worth monitoring. Lastly, safety and the custody of the asset class is needed before plan sponsors consider entering into this asset class. Most of these challenges are likely surmountable and will take time, if plan sponsors and the markets demand it. While not appropriate for plan sponsors today, the future of bitcoin as an asset class does not appear to be on the near horizon.

Disclaimer information:

Past performance is no guarantee of future results.

All investments carry risks. The risks of investing in cryptocurrency include the following: market risk, regulatory risk, security risk, tax risk, volatility risk, fraud risk, and insurance risk. All retirement plans should consult their investment, legal, and tax professionals prior to investing in cryptocurrency. If Milliman is an investment professional to your plan, you should consult directly with your representative prior to making any investment decisions related to cryptocurrency.

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