

Ahead of the Curve: Regulating Bitcoin-based Derivatives

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Table of Contents

INTRODUCTION/PURPOSE.....	3
BACKGROUND.....	3
BITCOIN TODAY.....	7
OVERVIEW OF DERIVATIVES.....	8
EFFECTS OF BITCOIN-BASED DERIVATIVES.....	9
REGULATION.....	13
CONCLUSION.....	16
APPENDIX.....	17
REFERENCES.....	19

Introduction/Purpose

In the aftermath of the economic crash in 2008 an individual utilizing the pen name Satoshi Nakamoto created Bitcoin, a virtual currency. Nakamoto invented Bitcoin in an effort to decrease reliance on banks. However, Bitcoin has become more than a currency; it has been a revolutionary piece of technology. The Bitcoin technology has paved the way for other technological monetary breakthroughs. Especially notable is the creation of Bitcoin-based derivatives. Derivatives are contracts based on an underlying product, in this case, Bitcoin. Normal derivative products can be agricultural products such as wheat and corn or financial ones such as stocks and bonds. Investing in derivatives involve speculating on an underlying products future. The types of Bitcoin-based derivatives include options, swaps, futures contracts, and forwards. While Bitcoin has spawned many technological breakthroughs, one major uncertainty is the inconsistent degree of regulation of Bitcoin, specifically derivatives. The Commodities Futures Trading Commission (CFTC) should issue a set of explicit regulations for cryptocurrencies in order to protect user's bitcoins and increase trust in Bitcoin. Bitcoin derivatives are imperative to the future of the currency, and regulations will ensure this future.

Throughout this paper, I will be using "Bitcoin" to refer to the network and software but will use "*Bitcoin*" when referring solely to the currency aspect of the software.

Background

Bitcoin is a decentralized virtual currency that utilizes peer-to-peer transactions. The term decentralized means that there is no central authority that controls Bitcoin. For example, the US Federal Government (specifically the Treasury Department) controls the printing and flow of money; however, with Bitcoin, there is no department that has such oversight.

Another unique characteristic of Bitcoin is that transactions are considered to be peer-to-peer (person-to-person). Currently, most transactions that involve traditional currencies require a 3rd party to process the transaction. For example, PayPal and credit card companies act as third parties and increase transaction costs by charging the seller for the processing of the transaction. Bitcoin transaction fees are much lower, therefore, lowering the price for sellers, and sometimes buyers (see Figure 1). Bitcoin is essentially cash for the Internet since cash is peer-to-peer as well.

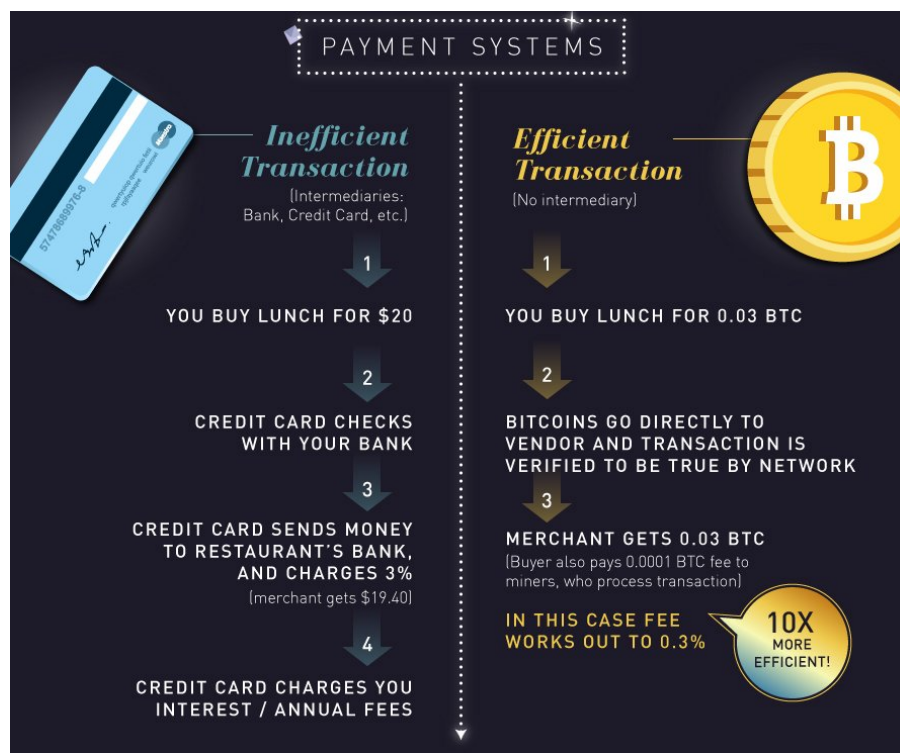


Figure 1 Credit Card vs. Bitcoin transactions (Desjardins)

Unlike traditional currency, Bitcoin processing is not centralized. The transaction processing is done by Bitcoin “miners.” Bitcoin mining is the process of using one’s computer power to process Bitcoin transactions. Anyone who has the requisite computing equipment can be a Bitcoin miner. Miners receive rewards for processing transactions from the Bitcoin

software. These rewards are the new *Bitcoins* entering the Bitcoin marketplace. In the U.S., this equates to new currency bills being printed. Miners also receive a very nominal transaction fee. Nakamoto constructed the software so that as more *Bitcoins* are mined the mining process requires more computer power. In *Bitcoin: A Primer for Policymakers* the authors find a similarity with Bitcoin and prime numbers, “it used to be fairly easy to find the small ones ... But as they were found it got harder to find the larger ones.”¹ The two main purposes of miners are to process transactions and to enter new *Bitcoins* into circulation. Figure 2 displays the number of *Bitcoins* in circulation, and since the mining difficulty increases as time goes on, the new *Bitcoins* being released into circulation will decrease over time. As of now, the limit on the number of *Bitcoins* in circulation is 21 million, which could cause some future problems since the number of users could be growing, but the number of *Bitcoins* in circulation will not deviate, therefore possibly causing spiraling inflation. This problem can be fixed by altering the software. The miners have control over the software and can vote to change it.

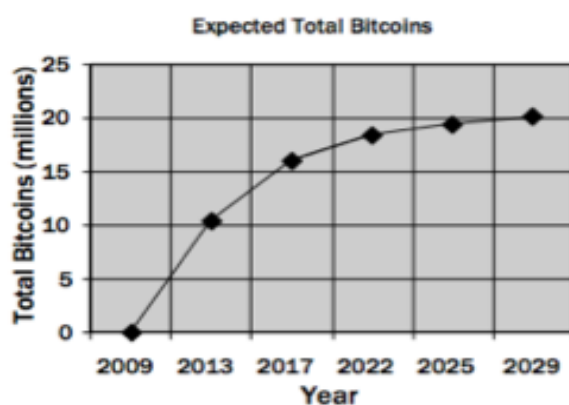


Figure 2: Projected *Bitcoins* in circulation (Grinberg 164)

¹ Brito, J., Castillo, A. Bitcoin A Primer for Policymakers. Mercatus Center at George Mason University, 2013. https://www.mercatus.org/system/files/Brito_BitcoinPrimer.pdf

The Blockchain is a public ledger of all the Bitcoin transactions, which anyone can access. The blockchain stores every Bitcoin transaction that has been processed, and it is publicly accessible. The blockchain ledger only displays each user's wallet ID, so the identities of each party in a transaction are not known (see Figure 3). Once a miner finishes mining a set of transactions, those transactions go to the blockchain. (Figure 4 displays this process).

Latest Transactions	Wallet ID	Amount of Bitcoins Exchanged
3fa6572aa5b72762193384a10...	< 1 minute	0.52849294 BTC
dcc0d343c5a32c07069ff3f8d...	< 1 minute	20.33275035 BTC
638adb38b2bb7a326ebc94a1f...	< 1 minute	2.39528335 BTC
dfef08eb31d3fe97dc6a659a7...	< 1 minute	0.52865882 BTC
d706e790f1f8877c60b7d86f8...	< 1 minute	0.00628938 BTC

Figure 3: Diagram of Blockchain (Blockchain.info)

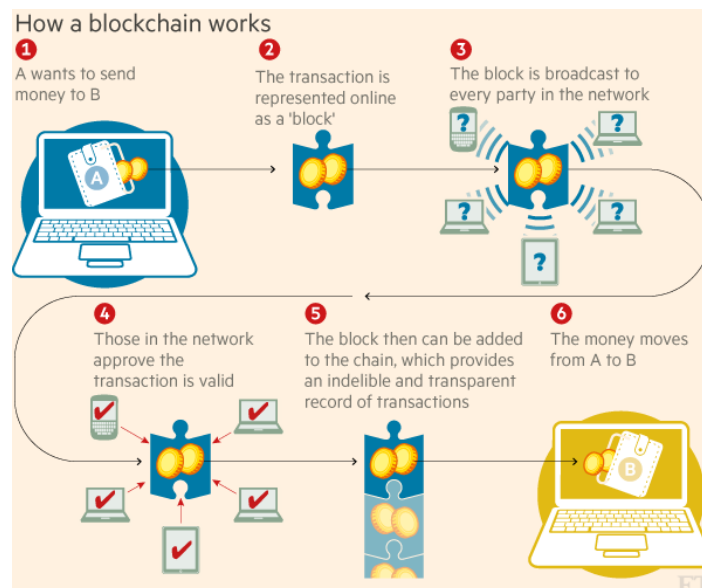


Figure 4: Overview of mining process (World Economic Forum)

Bitcoin Today

Some concerns about Bitcoin are that its price is volatile and that *Bitcoins* are susceptible to theft. Ever since its inception, *Bitcoin's* price has been extremely volatile in comparison to other currencies. Bitcoin's price has fluctuated over 20%, and that is just on one day.² *Bitcoin's* price volatility, similarly to stocks, is closely correlated with the public's perception of Bitcoin. A study done on Google searches and Bitcoin showed that "[A]round the 30th week, Google hits begin to skyrocket, which corresponds to a sharp upward trend in the number of transactions, creating a bubble in the market."³ If Bitcoin derivatives are regulated and, therefore, become safer, more of the general population will consider Bitcoin as an investment vehicle. The volatility has led Bitcoin not to be classified as a currency and compared more to gold. According to *Bitcoin: An Innovative Alternative Digital Currency*, "Bitcoin competes with at least two classes of products: (1) products that facilitate internet-based commerce, and (2) gold-backed currencies".⁴

The second concern about Bitcoin is that *Bitcoins* are susceptible to online theft, which is one of the largest fears among users. In the past, many exchanges have lost the funds of their clients due to the mishandling of *Bitcoins* or theft. For example, one of the largest Bitcoin exchanges, Mt. Gox, had about 850,000 *Bitcoins* stolen from them in 2015, which amounts to approximately \$12,711,750,000 as of January 3, 2018⁵. According to a survey done by

² Imbert, Evelyn Cheng, Fred. *Bitcoin Tops Record \$19,000, Then Plunges in Wild 2-Day Ride*. 7 Dec. 2017, <https://www.cnn.com/2017/12/06/bitcoin-tops-13000-surg-ing-1000-in-less-than-24-hours.html>.

³ Bucholz, Martis, Jess Delaney, Joseph Warren, and Jeff Parker. *Bits and Bets Information, Price Volatility, and Demand for Bitcoin*. Publication. Print.(pg. 13)

⁴ Grinberg, Reuben. "Bitcoin: An Alternative Digital Currency." *Hastings Science & Technology Law Journal*, vol. 40, no. 1, 2011, pp. 159-208. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1817857

⁵ *The Inside Story of Mt. Gox, Bitcoin's \$460 Million Disaster*. <https://www.wired.com/2014/03/bitcoin-exchange/>. Accessed 3 Jan. 2018.

Statista.com in the UK, 52% of people surveyed had concerns about security when using Bitcoin.⁶

Even though there are a plethora of positive uses for Bitcoin, there are also some illegitimate uses of Bitcoin. The illegitimate uses of Bitcoin are usually on the Deep Web, a part of the Internet that normal search engines cannot access, where piracy and trading of illegal products takes place. Bitcoin is the currency of choice for criminals on the Deep Web since the government has a hard time trying to track it. This is why *Bitcoin* is a prime target for hackers. Due to this, there are some people who feel that Bitcoin does more harm than good. An example of this is with Senator Joe Manchin (D-W.V.). He wrote a letter to the Treasury Department explaining why Bitcoin should be banned. He stated, “Before the U.S. gets too far behind the curve on this important topic, I urge the regulators to work together, act quickly, and prohibit this dangerous currency from harming hard-working Americans.”⁷

Overview of derivatives

One of the newer positive uses of Bitcoin is with derivatives. The four major types of Bitcoin-based derivatives are futures, options, forwards, and swaps.

With futures contracts, two parties will agree to make an exchange at a certain date (in the future) and set an exchange rate, which will not vary as the market changes.

Another type of derivative is an option. Options give the user the option to purchase an asset on a certain date at a pre-specified price, unlike futures contracts, which obligate the bearer

⁶ "Reasons for Not Using Bitcoin in Great Britain 2014." *Statista*. Accessed 18 Feb. 2016. <https://www.statista.com/statistics/292432/reasons-for-not-using-bitcoin-in-great-britain/>

⁷ *Manchin Demands Federal Regulators Ban Bitcoin | U.S. Senator Joe Manchin of West Virginia*. <https://www.manchin.senate.gov/newsroom/press-releases/manchin-demands-federal-regulators-ban-bitcoin>. Accessed 20 Dec. 2017.

of the contract to buy the asset. For example, Company A might have 5 Bitcoins, and if they believe that the price of Bitcoin will drop, they can provide Company B with the option to buy those bitcoins for \$5000 at a later date. If the price of Bitcoin rises Company B will earn a profit, but if the price declines, Company A will earn a profit.

Swaps are where two parties exchange a financial instrument. Swaps are the exchange based on an underlying asset. Bitcoin swaps are considered to be currency swaps since currency is what is being traded. These parties swap the currencies and on a later date, they trade the currencies again at a pre-specified exchange rate. Swaps are used to increase exposure to different currency markets.

Forward contracts are essentially the same as futures but they are traded on over the counter (OTC) markets. In addition, Forward contracts are considered to be more customizable than futures contracts. With OTC markets there are no designated exchanges, instead, deals are made by email, telephone, or even online bulletin boards. As a result, regulators have no central authority to regulate, such as an exchange would be regulated. This increases the risk when trading forwards.

Effects of Bitcoin-based derivatives

Bitcoin-based derivatives will have numerous positive effects. They could reduce the volatility in of Bitcoin, aid speculators, and businesses, and ensure the survivability of Bitcoin.

One benefit of Bitcoin derivatives is that they could possibly decrease the amount of volatility in the price of *Bitcoin*. In a study done on the Greek stock market and the introduction of futures contracts, the authors concluded: “There is a decrease on the volatility of the

FTSE/ASE-20 [Greek stock exchange] after the introduction of futures.”⁸ In addition, according to a study done by Statista.com⁹, the leading reason why people were concerned with using Bitcoin (as of 2014) was that the price is unpredictable. As the study of the Greek stock market demonstrated, Bitcoin-based derivatives may be able to reduce volatility, and therefore increase the number of people using Bitcoin.

Bitcoin derivatives can aid Bitcoin businesses in addition to speculators. Futures contracts, which are agreements to deliver a product at a pre-specified price at a later set date, can be used in two ways. They can be used either to speculate or to hedge against Bitcoin’s volatility. For example, in order to speculate with Bitcoin futures contracts, Party A who believes Bitcoin’s price will rise agrees to pay \$350 for one *Bitcoin* to Party B at a later date. If one *Bitcoin* trades at \$400 on that later date, Party A has profited since they have received one *Bitcoin* for \$50 less than the market value, but, Party B is an example of hedging since they did not take a loss either, as the price of Bitcoin stayed constant. Currently, some businesses that receive payments in *Bitcoin* will instantly sell their *Bitcoins* in fear that the price will drop¹⁰. With derivatives such as futures contracts, businesses will be better protected and the Bitcoin market will be more stable since businesses will no longer be afraid to keep their *Bitcoins*.

Bitcoin derivatives are imperative to the survivability of the currency. Even if Bitcoin fails at becoming a day-to-day currency (like the US Dollar), it can still have a future as an investment. Baur, Hong, and Lee found that “Bitcoin is mainly used as an investment despite or

⁸ Siopis, Angelos, and Katerina Lyroudi. *The Effects of Derivatives Trading on Stock Market Volatility: The Case of the Athens Stock Exchange*. 2007. <https://pdfs.semanticscholar.org/aa18/2e23b088687e709ab475887091902a1b6646.pdf>

⁹ "Reasons for Not Using Bitcoin in Great Britain 2014." *Statista*. Accessed 18 Feb. 2016. <https://www.statista.com/statistics/292432/reasons-for-not-using-bitcoin-in-great-britain/>

¹⁰ Shadab, Houman B. *Regulating Bitcoin and Block Chain Derivatives*. Oct. 2014. <https://mbs.edu/getattachment/fircg/FIRCG-2016/Papers/8-Adrian-2c-KiHoonBitcoin-Baur-et-al-2015-P.pdf>

due to its high volatility and thus high returns.”¹¹ Even though people mostly use Bitcoin as an investment, it has been only recently that mainstream exchanges have started to offer or announced that they will offer Bitcoin-based derivatives.¹² Bitcoin derivatives are also necessary to the survivability of the currency due to the rise of other cryptocurrencies, sometimes referred to as “altcoins.” Bitcoin was the first cryptocurrency and many other of these “altcoins” have followed, claiming to improve upon the design of Bitcoin. According to Coinmarketcap, there are approximately 1400 cryptocurrencies that exist today.¹³ For example, Litecoin is essentially the same as Bitcoin, as it also relies on the blockchain, but Litecoin transactions are processed faster than Bitcoin ones. Litecoin transactions take approximately 2.5 minutes to be processed, while Bitcoin transactions take about 10 minutes.¹⁴ This makes it more ideal to be used as a day-to-day currency than Bitcoin. Furthermore, Bitcoin is capped at 21 million coins, while Litecoin is capped at 84 million, which could possibly keep the price of Litecoin lower, another way it could be more advantageous for day-to-day transactions.

Another form of altcoins come from hard forks. Hard Forks are a permanent divergence in the blockchain.¹⁵ These hard forks result in new currencies with a variation in the Bitcoin computer code. An example of this is the altcoin Bitcoin cash. On August 1, 2017, a group of miners initiated the hard fork and created Bitcoin cash. Bitcoin cash increases the block size for

¹¹ Baur, Dirk G., et al. *Bitcoin: Currency or Investment?* Dec. 2014. <https://mbs.edu/getattachment/fircg/FIRCG-2016/Papers/8-Adrian-2c-KiHoonBitcoin-Baur-et-al-2015-P.pdf>

¹² Baker, Nick, and Annie Massa. “Nasdaq Plans to Introduce Bitcoin Futures.” *Bloomberg.Com*, 29 Nov. 2017, <https://www.bloomberg.com/news/articles/2017-11-29/nasdaq-is-said-to-plan-bitcoin-futures-joining-biggest-rivals>.

¹³ “Cryptocurrency Market Capitalizations.” *Coinmarketcap*, 2 Jan. 2018, <https://coinmarketcap.com/all/views/all/>.

¹⁴ Küster, Felix. *Bitcoin vs. Litecoin: Comparing Two of the Most Popular Cryptocurrencies*. 8 Dec. 2017, <https://captainaltcoin.com/bitcoin-vs-litecoin/>.

¹⁵ *Hard Fork, Hard-Forking Change - Bitcoin Glossary*. <https://bitcoin.org/en/glossary/hard-fork>. Accessed 2 Jan. 2018.

miners in order to accelerate the verification process.¹⁶ (see Figure 5) According to Coinmarketcap, Bitcoin cash is currently the 4th largest cryptocurrency by market capitalization.

See how Bitcoin Cash compares to Bitcoin Core

This chart compares the differences between Bitcoin Cash (BCH) and Bitcoin Core (BTC)

Infographic by Bitcoin.com

	Bitcoin Cash	Bitcoin Core
Low cost transaction fees	✓	✗
Fast peer-to-peer transactions	✓	✗
Reliable transactions	✓	✗
Accepts 0-confirmation transactions	✓	✗
Decentralized development teams	✓	✗
Permissionless network and development	✓	✗
Open source code	✓	✓
Limited supply (21 million coins)	✓	✓
Proof of Work algorithm (SHA-256)	✓	✓
Dates back to the Genesis block	✓	✓
Digital currency	✓	✗

Figure 5: Bitcoin Cash vs. Bitcoin Core (@Bitcoin Twitter)

Competitors to Bitcoin are slowly gaining popularity because of changes to the original Bitcoin code, rendering them more efficient. As a result, Bitcoin may begin to lose favor as the go-to currency for normal transactions. Bitcoin-based derivatives will be able to provide a use for Bitcoin in the case of its decline, therefore ensuring the survivability of the currency. Furthermore, the future of Bitcoin derivatives will be important for other cryptocurrencies, as exchanges could start to create derivatives for altcoins. If the regulators make attempts to regulate Bitcoin now, they will be more prepared for regulatory challenges when other altcoins gain favor over Bitcoin.

¹⁶ Frankenfield, Jake. *Bitcoin vs. Bitcoin Cash: What's the Difference?* 4 Aug. 2017, <https://www.investopedia.com/tech/bitcoin-vs-bitcoin-cash-whats-difference/>.

Regulation

In order for Bitcoin derivatives to gain popularity, there needs to be clear regulation by government agencies. This will be a challenge since regulation is an attempt to centralize control over of a currency that's original purpose is to be decentralized.

Because of a number of Bitcoin-related thefts, the New York State Department of Financial Services (NYDFS) issued a "BitLicense" which required all Bitcoin exchanges to adhere to their regulations in order to operate. This license requires each business to report comprehensive information such as each transaction, and the exchange's finances. In addition, the "BitLicense" requires exchanges to know their customers. This legislation has filtered out many of the fraudulent exchanges. Some other states are following suit. On the other hand, some Bitcoin supporters are not pleased with these regulations since they can hurt the marketplace. These regulations will apply to derivative exchanges depending on what state they are in, but there needs to be further regulation for the derivatives themselves, such as where they need to be traded.

There is also a question of who will regulate Bitcoin. At this point, it seems like the CFTC will be the main regulator for Bitcoin derivatives. In September of 2015, the CFTC issued a cease and desist letter to the company Coinflip, which operated an exchange called Derivabit. Derivabit was offering swaps but was not registered. This was illegal under the Commodity Exchange Act (CEA), which requires all swaps exchanges to be regulated by the CFTC. In this action against Coinflip, the CFTC said "Section 1a(9) of the [Commodity Exchange] Act defines "commodity" to include, among other things, "all services, rights, and interests in which contracts for future delivery are presently or in the future dealt in." 7 U.S.C. § 1a(9). The definition of a "commodity" is broad. See, e.g., Board of Trade of City of Chicago v. SEC, 677

F. 2d 1137, 1142 (7th Cir. 1982). Bitcoin and other virtual currencies are encompassed in the definition and properly defined as commodities.”¹⁷ This means that the CFTC will most likely be a regulator of Bitcoin derivatives, but it does not say the CFTC will be the only one. Also, even though they have taken action for a violation of the Commodity Exchange Act, they have not openly declared Bitcoin derivatives to be under the full scope of regulation by the Commodity Exchange Act. At this point, it seems as though the CFTC is regulating Bitcoin derivatives exchanges, but it has not explicitly declared that Bitcoin derivative exchanges are under the same the full scope of regulations that normal derivative exchanges have to follow.

The CFTC has not yet declared what type of commodity Bitcoin is. There are three types of commodities: agricultural, excluded, and exempt. At this point in time Bitcoin should be classified as an exempt commodity. Bitcoin cannot fall under the category of an agricultural commodity since it has nothing to do with agriculture. According to the CEA “The term “excluded commodity” means “(i) an interest rate, exchange rate, currency, security, security index, credit risk or measure, debt or equity instrument, index or measure of inflation, or other macroeconomic index or measure;”¹⁸ This lengthy list includes currency. Bitcoin could be considered a currency since it is used for the buying and selling of products, just as a traditional currency would be used. Exempt commodities are defined as “a commodity that is not an excluded commodity or an agricultural commodity.” Examples of exempt commodities include gold and other metals.

¹⁷ Commodity Futures Trading Commission. *ORDER INSTITUTING PROCEEDINGS PURSUANT TO SECTIONS 6(c) AND 6(d) OF THE COMMODITY EXCHANGE ACT, MAKING AND IMPOSING REMEDIAL SANCTIONS*. 17 Sept. 2015
<http://www.cftc.gov/idc/groups/public/@lrenforcementactions/documents/legalpleading/enfcoinfliporder09172015.pdf>

¹⁸ United States. Commodity Exchange Act. 74th Cong., 2nd sess. Washington: GPO, 1936. Print.

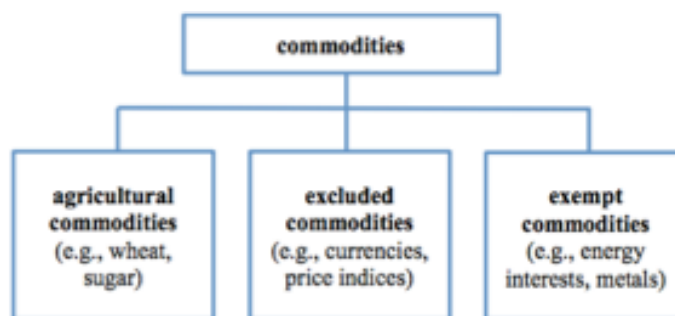


Figure 6: Types of Commodities (Shadab 4)

Bitcoin should fall into this category since it was created to model gold, even though there is no inherent value. In Nakamoto’s whitepaper on Bitcoin, he wrote, “The steady addition of a constant amount of new coins is analogous to gold miners expending resources to add gold to circulation. In our case, it is CPU time and electricity that is expended.”¹⁹ There are too many technological aspects of Bitcoin for it to be considered just a currency at this point in time. In the future, this could change if Bitcoin becomes more widely used as a traditional currency instead of an investment.

Even with the CFTC mainly regulating Bitcoin derivatives, the SEC could still regulate them as well. In Section § (2a)(1) of the Securities Act of 1933, a security is defined as “any note, stock, treasury stock, security future, security-based swap, bond....investment contract.”²⁰ Derivatives such as futures and swaps do, in fact, fall under the definition of a security but Bitcoin itself is not a security. The main argument for Bitcoin derivatives to be considered

¹⁹ Nakamoto, Satoshi. *Bitcoin: A Peer-to-Peer Electronic Cash System*. <https://bitcoin.org/bitcoin.pdf>.

²⁰ Securities Act of 1933 (48 Stat. 74, 15 U.S.C. 77a-77mm)

securities is that they are “investment contracts.”²¹ In the case *W.J. vs Howey Co.* “For purposes of the Securities Act, an investment contract (undefined by the Act) means a contract, transaction, or scheme whereby a person invests his money in a common enterprise and is led to expect profits solely from the efforts of the promoter or a third party, it being immaterial whether the shares in the enterprise are evidenced by formal certificates or by nominal interests in the physical assets employed in the enterprise.”²² Some would consider a Bitcoin to be an investment contract since one is investing their money, and the SEC regulates traditional derivatives. We have yet to see who will take full control over the regulation of derivatives, but at this point in time, it seems like that task will fall on the shoulders of the CFTC with the possibility of the SEC stepping in on certain occasions.

Conclusion

The innovation of Bitcoin-based derivatives represents an advancement and opportunity for the global market. For the US to compete in this market, the CFTC needs to issue a set of explicit regulations for Bitcoin-based derivatives, or try to incorporate Bitcoin into the current regulatory regime as an exempt commodity. If the CFTC does this, Bitcoin will open up opportunities for US citizens seeking to use Bitcoin both as a currency and especially as an investment, further ensuring the future of cryptocurrency investments.

²¹ Colesanti, J. Scott. *Trotting out the White Horse: How the S.E.C. Can Handle Bitcoin's Threat to American Investors*. Research report no. 2015-02, 2015. Legal Studies Research Paper Ser.

²² *SEC v. W.J. Howey Co.* 328 US. Supreme Court of the US. 1946. Print.

Appendix

Altcoins – cryptocurrencies besides Bitcoin

Bitcoin - a decentralized virtual currency that operates as peer to peer (refers to software/technology)

bitcoin- the currency aspect of Bitcoin

Blockchain - a public ledger of all the Bitcoin transactions

Commodity Exchange Act- an act passed in 1936 providing regulation for commodities and futures markets

Commodity Futures Trading Commission (CFTC) - a federal government agency that regulates options and futures

Cryptocurrency - a form of currency that is based on mathematical algorithms

Derivative - a contract that holds value based on its underlying assets

Deep Web - a part of the internet that cannot be accessed by standard search engines. Lots of illegal activity takes place here.

Forward Contract/Forwards - an agreement to trade at a pre specified price and date; more flexible than futures contracts

Futures Contracts - an agreement to deliver something at a pre specified price at a later date

Hard Fork – a divergence in the blockchain, creating a new currency

Mining - The process of creating new Bitcoins in which one uses their computer power to process transactions and in turn get rewarded with the new Bitcoins that enter the market.

Peer to Peer - transactions that take place between the buyer and the seller; no middle entity

Securities Act of 1933 - legislation that requires any sale of securities to be registered with the SEC.

Securities and Exchange Commission (SEC) - a federal agency that regulates the securities industry and enforces securities laws

Swap - an exchange based on an underlying asset

WJ vs Howey Co.- defined the term investment contract and how its fits under securities

References

- Baker, Nick, and Annie Massa. "Nasdaq Plans to Introduce Bitcoin Futures." *Bloomberg.Com*, 29 Nov. 2017,
- Baur, Dirk G., KiHoon Hong, and Adrian D. Lee. Bitcoin: Currency or Investment? N.p.: n.p., 2014. Print.
- Bernstein, Bob. *Potential Regulation of Bitcoin by the CFTC*. N.p.: n.p., n.d. Print.
- Bitcoin Block Explorer*. N.p., 3 Mar. 2016. Web. 03 Mar. 2016. <<https://blockchain.info/>>.
- Brito, J., Castillo, A. Bitcoin A Primer for Policymakers. Mercatus Center at George Mason University, 2013.
- Brito, Jerry, Houman Shadab, and Andrea Castillo. "Bitcoin Financial Regulation: Securities, Derivatives, Prediction Markets, and Gambling." *Columbia Science & Technology Law Review* 16 (2014): 144-221. Print.
- Bucholz, Martis, Jess Delaney, Joseph Warren, and Jeff Parker. *Bits and Bets Information, Price Volatility, and Demand for Bitcoin*. Publication. Print.
- "Concerns about Using Bitcoin for Online Transactions in the United States as of December 2013." *Statista*. N.p., 2013. Web. 17 Feb. 2016.
- Colesanti, J. Scott. Trotting out the White Horse: How the S.E.C. Can Handle Bitcoin's Threat to American Investors. Research rept. no. 2015-02. N.p.: n.p., 2015. Print. Legal Studies Research Paper Ser.
- Commodity Futures Trading Commission. *ORDER INSTITUTING PROCEEDINGS PURSUANT TO SECTIONS 6(c) AND 6(d) OF THE COMMODITY EXCHANGE ACT, MAKING AND IMPOSING REMEDIAL SANCTIONS*. 17 Sept. 2015

“Cryptocurrency Market Capitalizations.” *Coinmarketcap*, 2 Jan. 2018

Desjardins, Jeff. "How Bitcoin Can and Will Disrupt the Financial System." *Visual Capitalist*.

Visual Capitalist, 09 July 2014. Web. 02 Mar. 2016.

Frankenfield, Jake. *Bitcoin vs. Bitcoin Cash: What's the Difference?* 4 Aug. 2017,

Grinberg, Reuben. "Bitcoin: An Alternative Digital Currency." *Hastings Science & Technology Law Journal* 40.1 (2011): 159-208. Print.

Hard Fork, Hard-Forking Change - Bitcoin Glossary. <https://bitcoin.org/en/glossary/hard-fork>.

Accessed 2 Jan. 2018.

"How Will Blockchain Technology Transform Financial Services?" *World Economic Forum*.

World Economic Forum, 3 Nov. 2015. Web. 02 Mar. 2016.

Imbert, Evelyn Cheng, Fred. *Bitcoin Tops Record \$19,000, Then Plunges in Wild 2-Day Ride*. 7

Dec. 2017,

Küster, Felix. Bitcoin vs. Litecoin: Comparing Two of the Most Popular Cryptocurrencies. 8

Dec. 2017

Lee, Timothy B. "An Illustrated History of Bitcoin Crashes." *Forbes*. N.p., 11

Apr. 2013. Web. 18 Oct. 2015.

Llanos, Juan. "Will Bitcoin Change How We Think about Regulation?" *Coin Center*.

N.p., n.d. Web. 22 Oct. 2015.

Manchin Demands Federal Regulators Ban Bitcoin | U.S. Senator Joe Manchin of West

Virginia. Accessed 20 Dec. 2017.

McMillan, Robert. *The Inside Story of Mt. Gox, Bitcoin's \$460 Million Disaster*. Accessed 3

Jan. 2018.

Nakamoto, Satoshi. *Bitcoin: A Peer-to-Peer Electronic Cash System*.

"Official" Bitcoin Twitter Account Deems Bitcoin Cash to Be the Superior Version. 7 Jan. 2018

"Reasons for Not Using Bitcoin in Great Britain 2014." *Statista*. N.p., n.d.

Web. 18 Feb. 2016.

SEC v. W.J. Howey Co. 328 US. Supreme Court of the US. 1946. Print.

Securities Act of 1933 (48 Stat. 74, 15 U.S.C. 77a-77mm)

Shadab, Houman B. *Regulating Bitcoin and Block Chain Derivatives*. N.p.: n.p.,

2014. Print.

Siopis, Angelos, and Katerina Lyroudi. *The Effects of Derivatives Trading on*

Stock Market Volatility: The Case of the Athens Stock Exchange. N.p.: n.p.,

2007. Print.

United States. *Commodity Exchange Act*. 74th Cong., 2nd sess. Washington: GPO,

1936. Print.