Coins in the Air: A Literature Review on the Evolving Framework of Bitcoin and its Relevance to the Accounting Profession

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Coins in the Air

A literature review on the evolving framework of bitcoin and its relevance to the accounting profession

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Abstract

Bitcoin is an innovative virtual currency, which has gained much commercial traction, yet is widely overlooked by the accounting profession. Due to its parallels with actual currencies and its growing use, accountants should be aware of what bitcoin is, including its risks and benefits, in order to properly leverage its business uses. Of the existing financial instruments, derivatives stand out in their potential to stabilize the bitcoin market. Bitcoin regulation is sparse, but evolving, especially in the face of the emerging bitcoin securities and derivatives markets. The accounting profession is poised to play a major role in facilitating the future of proper regulation and oversight of Bitcoin.
Acknowledgements

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Introduction

Technology and the Business Environment

The advents of technological innovation have added both convenience and complexity to the business environment. Most notable of these innovations are computers and the Internet. Computers have allowed automation of basic office functions and the ability to solve highly complex mathematical problems in little to no time. The Internet has allowed globalization on a scale never before possible, as transactions and messages can be relayed instantly and reliably\(^1\). While these offer obvious convenience for business purposes, some complexities arise as well. Computers that are widely connected can be prone to issues of information integrity and privacy concerns. This balance between convenience and complexity has remained to this day, and is relevant to other emerging technologies, one of the most recent being virtual currencies.

Virtual Currencies

Before delving into virtual currency, an understanding of fiat and commodity currencies should be established. Fiat currency is a monetary unit, backed by a central government to be used as a method of exchange. Its value is based on supply and

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\(^1\) Vitez, “The Effect of the Internet on Modern Businesses & Corporations.”
demand, as well as faith in the central government. Commodity currency is similar to fiat currency, except its value is generally derived from a physical commodity, most notably gold or silver. Most modern currencies, like the U.S dollar, are fiat currencies. Virtual currencies mainly differ from fiat and commodity due to differences in government backing and underlying physical commodities.

Virtual currency is a product of computer technology and the Internet, and is under the umbrella of digital currency. The Financial Action Task Force is a jointly supervised organization between the major G7 countries, which works to combat financial crimes such as laundering. It breaks digital currency down to either (1) virtual currency or (2) e-money. The main difference is that e-money is a direct representation of, and denominated in, an actual fiat currency. On the other hand, virtual currency lacks legal tender status, as it isn’t backed by any central government. Even without this legal backing, virtual currencies still serve as a medium of exchange, a unit of account and a store of value. And most importantly, they can still be exchanged digitally. They have stemmed from a variety of online environments, like within the game, World of Warcraft. Outside of video games, examples of more openly used virtual currencies are Bitcoin and Litecoin. Virtual currencies stand out in my research due to the level of innovation possible, and the most popular of them all, Bitcoin, has served as the basis for this literature review.

\[2 \text{ “Fiat Money Definition.”}\]
\[3 \text{ Virtual Currencies Key Definitions and Potential AML/CFT Risks.}\]
An overview of Bitcoin and Related Topics Relevant to Accountants

What is Bitcoin?

Digital payments and double spending

Digital payments have traditionally been managed by financial intermediaries like banks or credit card companies, which guard against the issue of double spending\(^4\). Double spending is the possibility of someone manipulating the lack of transparency in online transactions, to spend money they don’t have. Financial intermediaries generally take a cut from transactions they process in exchange for providing peace of mind from double spending. This peace of mind stems from the intermediaries’ ability to curb double spending, by verifying parties (ex. buyer and seller) involved in, and maintaining a ledger of all transactions.

Origins

In 2008, an anonymous programmer, going by the alias, Satoshi Nakamoto, published the proposal for Bitcoin\(^5\). The purpose of this paper was to introduce a currency that solved the problem of double spending, without the need for a central authority like the U.S government, or financial intermediaries. The framework was dubbed Bitcoin, and the currency itself was lowercased as bitcoin. Nakamoto proposed Bitcoin would require technically capable users (miners) rather than central authorities to process transactions. Attempts to fool this community of users would result in rejected

\(^4\) [Bitcoin Explained and Made Simple | Guardian Animations - YouTube.]
\(^5\) [Nakamoto, “Bitcoin.”]
transactions. This framework would be decentralized, as no central authorities could charge fees or control transaction flow. In essence, it would be easier cheaper and timelier to transact online, even internationally.

**How does it work?**

The three main components of Bitcoin are users, miners, and the block-chain, all of which interact to facilitate transactions. Users transfer money by sending a message to the Bitcoin infrastructure, where the related transaction is distributed to miners. Miners provide their computing power to verify users and their transactions. The Block-Chain is then updated with that transaction by the miners computing power contribution.

Bitcoin makes use of Public Key Encryption (PKE) technology. With PKE, users have both a public key and a private key. Public keys are available to everyone, while private keys are known and accessible only to the user. When sending message for example, a user encrypts it with their public key, making it unintelligible to prying eyes. Once received, the person on the other end of the message users their own private key to decrypt the message to its original form. Thus, in Bitcoin, a private key is basically a tool to hide transactions from unwanted third parties. The private key puts a signature on the transaction, which is actually a mathematical formula, in order to verify where the bitcoin is coming from, and going to, as well as the amount. Miners decode this signature by solving the math that encoded it, with the public key. This solves the problem of double spending, by requiring immense computational power in solving uniquely complex mathematical functions.

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6 *The Essence of How Bitcoin Works (Non-Technical) - YouTube.*
8 Böhme et al., “Bitcoin.”
The Miners create and receive Bitcoin as an incentive for their participation. The mathematical problems their computing power solves, also goes toward adding a transaction to the previously mentioned ledger, called the block-chain. Bitcoin, as an online infrastructure, is programmed so that the computations progressively escalate in difficulty, requiring increased computing power. This also creates a convenient way to distribute bitcoin into the world, as a replacement for a central body like a treasury, which would increase or decrease cash supplies. Thus, the programming of the framework makes it so that only 21 million coins can ever be created, in order to limit inflation.9

**Key Takeaways**

Bitcoin works based on math and cryptography.10 Complex mathematical problems are solved in order to verify users and transactions, as well as update the ledger of all transactions.

Cryptography is a method of encoding messages, or making them unintelligible to unfamiliar eyes. Transactions within the block-chain are primarily encrypted using cryptography. Bitcoin is also dubbed a Crypto-currency due to its use of cryptography 11.

A bitcoin is not a physical item, nor file, but rather a record of a transaction, linked to all other transactions, in an open ledger. This open ledger is called the block chain, and it contains a record of every transaction that has ever occurred.

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9 Nakamoto, “Bitcoin.”
10 MONTERIO, “Flipping the (Bit) Coin.”
11 Ibid.
In essence, Bitcoin is a system of virtual currency based on a collaboratively maintained ledger. It uses math and cryptography to facilitate use of the currency, safeguard against double spending, and create new coins\textsuperscript{12}.

**Practical Uses**

Bitcoin is primarily used as a medium of exchange. Once created by a miner, it is then sold to a Bitcoin exchange such as Coinbase, which then distributes it to buyers at market price. Buyers then store their bitcoin in a wallet, to facilitate use\textsuperscript{13}. It can be used to purchase a variety of items, that fiat or e-money can purchase. The market price is based on people’s belief in the currency as well as the underlying framework, which prevents unfair changes to the block-chain.\textsuperscript{14} It has no inherent value, as any commodity or government doesn’t back it. Rather, its value lies in its usefulness as an alternative fiat currency. Speculative uses are also prevalent, as a result of the large degree of volatility that bitcoin has been subject to. This has been profitable for most exchanges, especially when bitcoin is at its most volatile\textsuperscript{15}.

**Benefits and Risks**

Bitcoin carries certain inherent benefits and risks. Benefits include immediate settlement, low transaction fees, and identity protection. Risks include unclear regulatory environment, hacking risk and volatility\textsuperscript{16}.

Transactions can be immediately settled using bitcoin. This provides faster clearing times, as the transactions occur peer to peer, between the two parties only, rather

\begin{footnotesize}
\begin{itemize}
    \item \textsuperscript{12} Nakamoto, “Bitcoin.”
    \item \textsuperscript{13} Böhme et al., “Bitcoin.”
    \item \textsuperscript{14} *The Essence of How Bitcoin Works (Non-Technical) - YouTube.*
    \item \textsuperscript{15} Bradbury, “Why Some Bitcoin Exchanges Might Die in 2015.”
    \item \textsuperscript{16} “Bitcoin Could Impact Credit Unions, Report Says.”
\end{itemize}
\end{footnotesize}
than requiring an intermediary\(^\text{17}\). The average Bitcoin transaction clears in about 10 minutes\(^\text{18}\).

There are little to no transaction fees when using Bitcoin. Credit card companies and banks often charge merchant and interchange fees, as well as fees due to international transactions\(^\text{19}\). Not having these intermediaries as a requirement for transaction processing removes the necessity for such fees on customers or merchants\(^\text{20}\).

Bitcoin has also been praised for its ability to protect user identity, as transactions are for the most part anonymous\(^\text{21}\). The cryptography used through private keys ensures the parties to the transactions don’t have to share private data such as name or location\(^\text{22}\). However, all transactions are kept in the block chain, and so if a private key were compromised, it would be possible to identify them\(^\text{23}\).

An unclear regulatory environment is a current concern for bitcoin. Due to Bitcoins’ anonymous nature, it has already been used for criminal activities. One of the most notable is Silk Road, in which bitcoins were used to purchase narcotics and other illegal services\(^\text{24}\). Considering its infancy, regulation for bitcoin has been sparse, but mostly focused on financial crime enforcement\(^\text{25}\). This leaves much room for regulation.

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17 Nakamoto, “Bitcoin.”


19 Rampton, “How Bitcoin Is Changing Online eCommerce.”

20 Ibid., 2.


22 Nakamoto, “Bitcoin.”


regarding securities and accounting treatment that can begin an understanding towards creating proper regulation.

Hacking risk is another risk due to Bitcoin being based online. Mt.Gox, a popular bitcoin exchange, was shut down in 2014, due to a hacking incident in which a large volume of bitcoin was stolen. Bitcoin wallets are also subject to theft, if users do not take the right precautions to ensure their private keys are kept secure through proper storage and authentication methods.

Volatility is another risk that Bitcoin is subject to. This can be attributed towards the Bitcoin being fairly new. It has only been around since 2008, and has yet to discover a stable price. Also, because it is thinly traded compared to other currencies, large transactions have more of an effect on overall price swings. As an example of past volatility, Raiborn and Sivitanides stated in their research, “Consider that the (rounded) market price (according to Coinbase.com) of one BTC went from $1,117 to $723 between Wednesday, December 4, and Saturday, December 7, 2013.”

**Bitcoin Relevance to Accounting**

**The accounting profession**

Accounting is commonly referred to as the language of business. This is because accountants communicate financial information to interested parties, including consumers, managers, stockholders and creditors. However, the accounting profession

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“What Are the Risks of Investing in Bitcoin?”


has been known to be conservative\(^{31}\). This is inherent in principles like conservatism, which rely on accountants to be risk averse and highly detailed. As mentioned in the last section, Bitcoin does carry some risk, as it is still evolving and seeking stability. However, Virtual currencies are highly relevant to the accounting profession, and need its attention, due to several factors. The CEO of the International Federation of Accountants has stated, “Bitcoin poses opportunities to strengthen and expand the scope of what accountants do and how we do it\(^{32}\).” Its inherent nature, as a form of financial value, existing and functioning primarily in an electronic form, serves as an opportunity to bridge the gap between accounting and information technology.

**Financial Value**

The most important point to start on, in terms of Bitcoins’ relevance to accounting, is that it holds financial value. While it is not as liquid as cash, it does fit a classification, as an asset. As Raiborn and Sivitanides have cited from the FASB, “...it represents a probable economic benefit for a particular entity and that has resulted from a past transaction\(^{33}\)...” It can be most closely identified as a short or long term investment, and is subject to capital gains for tax purposes\(^{34}\). Market capitalization serves as an indicator of the overall dollar value of all units of a security in circulation. Bitcoin reached $8 Billion of capitalization in July of 2014\(^{35}\). By the end of last year, bitcoin ranked number one in market cap, in relation to other crypto-currencies\(^{36}\). Despite its

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\(^{31}\) “Do Good Accountants Make Bad CFOs?”
\(^{32}\) Choudhury, “It’s Not Really about Bitcoin, It’s about Change.”
\(^{33}\) Raiborn and Sivitanides, “Accounting Issues Related to Bitcoins.”
\(^{34}\) Ibid.
\(^{35}\) Böhme et al., “Bitcoin.”
\(^{36}\) “Bitcoin Could Impact Credit Unions, Report Says.”
unconventional nature, bitcoin is financially valuable, and thus should be within the scope of accountants, as all other assets are.

**Availability as Securities**

Bitcoin exposure has become available in various forms of securities as well, aside from as a standalone virtual currency. The most relevant types thus far are investment funds and derivatives. Investment funds pool investor capital to strategically allocate towards positions in other assets or commodities, and limit risk. Derivatives are financial instruments that derive their value from something else, like wheat, gold, or even the weather.

Several bitcoin funds are already in existence as electronically traded funds. The Bitcoin Investment Trust (BIT) was introduced in 2013, to allow investors to take short and long positions in bitcoin through share trading. It was created as a private fund, and its value closely tracked that of the actual bitcoin market. BIT successfully received initial funding of $2 million. By the end of 2013, its value reached $61.1 Million. It was the first of its kind and gained regulatory approval from the Financial Industry Regulatory Authority (FINRA) in March of 2015. Winklevoss Capital has also created a Bitcoin fund, dubbed the Winklevoss Bitcoin Trust, and is currently seeking regulatory approval. Within this trust, bitcoins are directly held, and the fund itself is passively managed, meaning there is no preset strategy or model for allocating funds, reducing management fees. It was created with the goal of offering a more cost effective and

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37 Kelly, “Bitcoin’s Golden Moment.”
38 Danny Bradbury, “SecondMarket’s Bitcoin Investment Trust Amasses $61.1 Million in 3 Months.”
39 Kelly, “Bitcoin’s Golden Moment.”
accessible means of exposure to bitcoin\textsuperscript{41}. While BIT is aimed at wealthier individuals, the Winklevoss Bitcoin Trust is structured as a more affordable option. In essence, such funds have been noted as signs of maturity in the bitcoin market, with potential to stabilize the price\textsuperscript{42}.

Derivatives have also emerged, as a form of bitcoin exposure. In 2012, ICBIT.se was launched, as a facilitator of bitcoin futures, based in Russia\textsuperscript{43}. It doesn’t perform a clearing function for contracts; rather it matches willing buyers and sellers\textsuperscript{44}. Standing among the largest of bitcoin derivative exchanges, it reached $15 Million worth of transactions from facilitating contracts in just May of 2014\textsuperscript{45}. Another firm, BTC.sx, was launched in 2013, as a margin-trading platform\textsuperscript{46}. Based in Singapore, it allows users to take short (assuming bitcoin price will fall) and long (assuming bitcoin price will rise) positions on bitcoin\textsuperscript{47}. Its positions offer leverage for a possibility of enhanced profits. As stated by Shadab, “By January of 2014, BTC.sx reported $35 million in total trading since its launch and an active user base of 3,300 traders\textsuperscript{48}.” Of notable mention is TeraExchange, which is based in New Jersey (as of 2010) and offers bitcoin swaps\textsuperscript{49}. Unlike the previously mentioned firms, TeraExchange offers cash settled contracts, and is the only firm which is licensed (as of November 2014) by the U.S Commodities Futures

\begin{thebibliography}{99}
\bibitem{41} Ibid., 175.
\bibitem{42} “Bitcoin’s Golden Moment.”
\bibitem{43} Brito, Shadab, and Castillo, \textit{Bitcoin Financial Regulation}, 183.
\bibitem{44} Ibid.
\bibitem{45} Shadab, “Regulating Bitcoin and Block Chain Derivatives,” 10.
\bibitem{46} Brito, Shadab, and Castillo, \textit{Bitcoin Financial Regulation}, 184.
\bibitem{47} Ibid.
\bibitem{48} Shadab, “Regulating Bitcoin and Block Chain Derivatives,” 13.
\bibitem{49} Ibid., 12.
\end{thebibliography}
Trading Commission (CFTC)\textsuperscript{50}. These derivatives offer hedging and speculative uses to companies and individuals interacting with bitcoin.

These financial instruments show the maturity of Bitcoin, as something that should hold significant relevance to the accounting profession. Despite bitcoin not being a legal currency, these instruments represent financial value in terms of their speculative and hedging uses. Also, they maybe subject to regulations that auditors, both internal and external should be aware of, especially in the face of legislation like Sarbanes-Oxley.

**Growth in Use and Popularity**

Since its inception, Bitcoin has seen dramatic growth and use among consumers and merchants. In its current state of maturity, it can be exchanged between U.S dollar (among other currencies), and purchase goods and services, both online and in store\textsuperscript{51}. There are also bitcoin ATMs available in selective areas. Other improvements such as better apps and online services for bitcoin wallets, have given companies more confidence in accepting bitcoins\textsuperscript{52}.

These qualities give bitcoin ample usefulness for commerce. According to findings by Christopher, “Bitcoins can be used to buy electronics, jewelry, paintball equipment, and clothing, and to pay for healthcare, technical support, hotel rooms and restaurant meals\textsuperscript{53}.” With the benefit of significantly low transactions costs, many merchants currently accept bitcoin as payment\textsuperscript{54}. Most notable of these merchants include

\textsuperscript{50} Ibid.; “Derivatives Exchanges Look to Add Liquidity to the Bitcoin Market.”  
\textsuperscript{51} Greene and Shy, “E-Cash and Virtual Currency as Alternative Payment Methods.”  
\textsuperscript{52} Raiborn and Sivitanides, “Accounting Issues Related to Bitcoins.”  
\textsuperscript{53} Christopher, “Why on Earth Do People Use Bitcoin?,” 7.  
\textsuperscript{54} Rampton, “How Bitcoin Is Changing Online eCommerce,” 2.
overstock.com, wordpress.com, Expedia and Lord & Taylor, as well as the Sacramento Kings\textsuperscript{55}. In 2014, the number of merchants accepting bitcoin ranged in the tens of thousands\textsuperscript{56}.

**Gap between Accounting and Information Technology**

Bitcoin represents a bridge between accounting and information technology, in the way that it merges the currency with technological concerns. Virtual currencies introduce technical details, which may be overwhelming at first glance for accountants, but the risk of financial fraud due to virtual currencies remains a reason not to shy away from them\textsuperscript{57}. The concepts of cryptography and digital signatures are well known to information technology experts, and necessary for a full understanding of how a virtual currency like Bitcoin works. Also, technology-related crimes are of importance to accounting, in the scope of auditing to anticipate necessary internal controls. In 2014 alone, there were several high profile data breaches, including those on Sony Pictures, Target, Staples, Home Depot and JPMorgan Chase\textsuperscript{58}. The cryptography used by Bitcoin supports overall security and privacy\textsuperscript{59}. This technology is applicable towards sending messages, currencies, and documents between businesses, and maintaining secrecy and integrity between senders and receivers. In light of these data breaches, accountants for such companies would benefit from a good understanding of cryptography and digital signature concepts. Both internal and external auditors would improve their marketability and usefulness by being able to explain and implement these concepts as well.

\textsuperscript{55} MONTERIO, “Flipping the (Bit) Coin.”; “5 Bitcoin Trends That Have Emerged in 2014 (So Far).”
\textsuperscript{57} Raiborn and Sivitanides, “Accounting Issues Related to Bitcoins,” 33.
\textsuperscript{58} Granville, “8 Recent Cyberattacks Against Big Businesses.”
\textsuperscript{59} Nakamoto, “Bitcoin.”
Accounting related bitcoin issues

There are several issues accountants should be aware of in order to better understand Bitcoins implications and work towards creating proper guidelines for its treatment. First off, there are no generally accepted accounting principles for bitcoin, and accounting for it currently falls under other comprehensive basis\textsuperscript{60}. This already sets the tone for further research and accounting oversight for such a highly used virtual currency. Overall research on bitcoin tripled in 2014 alone\textsuperscript{61}. This included several economic, accounting, and finance related papers and articles.

As previously mentioned, bitcoins are most closely classified as short or long term investments\textsuperscript{62}. Due to an IRS proclamation in 2014, it is subject to transactional capital gains, which emphasizes it isn’t cash. Yet, it is still subject to substantial record keeping requirements by companies, as compliance with regulations relating to money laundering and fraud\textsuperscript{63}.

For bitcoin miners, there needs to be a standard for them to account for value of the coins they mine, in order to examine their profit or loss from doing so. As prior mentioned, computing power is needed in order to mine bitcoins, and the costs of maintaining equipment and necessary electricity, can become quite expensive\textsuperscript{64}. A proposed method of bitcoin valuation for miners would be to allocate these costs to

\textsuperscript{60}Raiborn and Sivitanides, “Accounting Issues Related to Bitcoins.”
\textsuperscript{61}Wong, “Academic Research on Bitcoin Tripled in 2014.”
\textsuperscript{62}Raiborn and Sivitanides, “Accounting Issues Related to Bitcoins.”
\textsuperscript{63}Ibid.
\textsuperscript{64}Böhme et al., “Bitcoin.”
individual bitcoins\textsuperscript{65}. However, for those that solely mine bitcoins for a living, there should be more rigid guidelines on valuing bitcoins.

Value fluctuations are an issue for users during holding periods. This is a great concern for companies holding bitcoin, especially near financial statement dates\textsuperscript{66}. Earnings can be significantly thrown off due to large swings in the price of bitcoin, if a company acquired a large amount right after the financial statement date\textsuperscript{67}. Gains and losses become prevalent as well, when a transaction occurs with the bitcoins that were held. It is usually unlikely that the historical cost of the bitcoin will be the same when it is used to purchase something else\textsuperscript{68}. Thus, a question remains on how to value the newly acquired assets. Should the new assets’ basis be tied to the seller’s basis or the consideration offered by the buyer?\textsuperscript{69}

Mergers and acquisitions are another relevant issue, as some have already occurred, with bitcoin used as the consideration. The old owner of the company SatoshiDice was charged by the SEC due to issues arising from the sale of the company, which involved bitcoin as payment\textsuperscript{70}. The SEC made these charges on the grounds that unregistered securities were being offered in this deal. Changes in bitcoin value can affect the value of the acquisition as well\textsuperscript{71}. States from SEC guidelines, “All issuers selling securities to the public must comply with the registration provisions of the securities laws, including issuers who seek to raise funds using Bitcoin [and other] digital

\textsuperscript{65} Raiborn and Sivitanides, “Accounting Issues Related to Bitcoins.”
\textsuperscript{66} Ibid.
\textsuperscript{67} Ibid., 30.
\textsuperscript{68} Ibid., 31.
\textsuperscript{69} Raiborn and Sivitanides, “Accounting Issues Related to Bitcoins.”
\textsuperscript{70} Ibid., 31.
\textsuperscript{71} Raiborn and Sivitanides, “Accounting Issues Related to Bitcoins.”
currencies." Also, issues relating to goodwill or gains from the purchase will arise, as well as the related tax implications. This provides a further need for proper accounting guidelines related to bitcoin being used in mergers and acquisitions, and feeds into the issue of disclosure, such as considerations offered for merger and acquisitions.

Disclosure is another significant accounting-related issue. According to the full disclosure principle, “companies are obligated to provide all information that would likely influence the decisions of an informed user in an understandable and no misleading fashion.” Bitcoin is rather technical and carries its fair share of complexities. Companies may provide more clarification in their financial statements by disclosing information about bitcoin transactions in proportion to transactions using basic fiat currencies. Also, the intended holding periods of bitcoins and methods towards keeping holdings secure are also relevant topics for disclosure. Thus, reporting on Bitcoin related topics within financial statements requires clear guidelines. They can enhance the quantitative and qualitative portions of financial statements that provide confidence to relevant stakeholders whom rely on these statements.

**Derivatives as an Emerging Trend**

**Volatility and the role of Derivatives**

The risk of volatility has been a great concern for Bitcoin. Since its inception, it has experienced great price swings. There were points in time when market price in

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72 Ibid., 31.
73 Ibid., 32.
74 Ibid.
75 Raiborn and Sivitanides, “Accounting Issues Related to Bitcoins.”
relation to the U.S dollar could swing by 40% in the course of just one day. On one front, gains (realized and unrealized) have rewarded early users and investors. On the other hand, losses (realized and unrealized) have worried users, investors, government agencies and other relevant entities. Bitcoin has several innovative features such as the block-chain and digital signatures as a method to facilitate transactions. However, the volatility has held it back from further mainstream acceptance. Thus, a solution is needed to curb volatility, and in essence stabilize its price. This is where derivatives come into play in an indirect manner.

Derivatives are tools for both hedging and speculation. Hedging protects users from changes in value of the underlying asset, like a farmer looking to get the best price for his crop, as he faces uncertain climate conditions. Derivatives also provides opportunities for profit and loss; say if that farmer secured a contract that promised a much greater price, than he was initially willing to sell at, or in converse, contract price ended up being much lower than the market price. These opportunities have already attracted firms looking to provide liquidity to the bitcoin market by offering their own brands of derivatives. The prior mentioned BTC.sx, ICBIT.se, and TeraExchange are perfect examples of these. This sentiment is shared in industry media, with a 2014 Bloomberg article stating, “…a robust Bitcoin derivatives market may someday smooth the volatility that has plagued the digital currency. This can be done indirectly by

77 Bradbury, “Why Bitcoin’s Volatility Is Unique Among Commodities.”
78 MONTERIO, “Flipping the (Bit) Coin,” 11.
79 “Derivatives Exchanges Look to Add Liquidity to the Bitcoin Market.”
80 Brito, Shadab, and Castillo, Bitcoin Financial Regulation.
improving confidence in the Bitcoin infrastructure through added liquidity.” Thus, derivatives have stood out in my research as method to address the volatility of bitcoin.

**Hedging and Speculation**

Bitcoin derivatives provide hedging and speculation opportunities for those interacting with the currency.

Varying parties to bitcoin can benefit from a hedging opportunity. Miners can hedge their holdings in the face of already expensive mining costs such as electricity and hardware\(^{82}\). With electricity and hardware related costs as significant investments, those mining bitcoins would want to maintain the value of those coins, to ensure a feasible return. Average users holding bitcoin can easily hedge through use of BTC.sx, which has a rather open and easy to use platform. The positions offered are broken down into trading either short (hedging against falling prices) or long (hedging against rising prices) options\(^{83}\). The company Elliptic even offers an alternative hedging solution, in the form of unregulated insurance, for users at risk to lose their wallets\(^{84}\). The bitcoin exchange Coinbase already stands as a company that is highly vulnerable to the risk of volatility, as its business model is based on offering immediate liquidity by shouldering the volatility for clients\(^{85}\). Currently it uses algorithmic trading to manage risk of volatility but derivatives would add a greater level of safety. Companies that solely transact in bitcoin can benefit as well. For instance, overstock.com, a major online retailer accepts bitcoin as

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\(^{82}\) Cawrey, “Derivatives, Futures and Protecting Against Bitcoin’s Risks.”  
\(^{83}\) Shadab, “Regulating Bitcoin and Block Chain Derivatives,” 12; Cawrey, “Derivatives, Futures and Protecting Against Bitcoin’s Risks.”  
\(^{84}\) Cawrey, “Derivatives, Futures and Protecting Against Bitcoin’s Risks.”  
payment. As a publicly traded company, it is subject to stringent reporting requirements by the SEC. Such companies currently go with a strategy of immediately liquidating their bitcoin holdings, upon receipt. However, there is still a risk of earnings being thrown off by a major price swing right before or after a financial statement, if such a company was holding a significant amount of bitcoin. Even beyond such a circumstance, a company can be subject to price swings at any time, and would want to ensure it is covered for the sake of its longevity and stakeholder relations.

Speculation opportunities also exist within the realm of bitcoin derivatives. The BTC.sx trading platform allows leveraged positions up to 10 times. This creates an opportunity for enhanced gains, as well as losses, on price swings. Medium.com actually posted a report on the 10 most profitable derivative transactions on the BTC.sx platform, during a price swing in early 2015. As medium states, “In first place we have a trader that generated a 134.47% return on a 5.33 BTC deposit to produce a 7.33 BTC profit. This trader followed the market lower and was not deterred by minor corrections on the way down.” ICBIT.se also offers speculative opportunities with their contracts. Their futures contracts allow up to 5 times leverage on positions. By the end of February in 2014, ICBIT.se sales of their futures contracts had amounted to roughly $30 million. Obviously, the ability to hedge with bitcoin derivatives also provides profit potential. However, the potential for losses should still be acknowledged, and sites like BTC.sx

86 MONTERIO, “Flipping the (Bit) Coin.”
88 Ibid.
89 Cawrey, “Derivatives, Futures and Protecting Against Bitcoin’s Risks.”
90 “Top 10 Most Profitable Bitcoin Trades in the Price Crash.”
attempt to keep investors aware of these by placing safeguards, like margin deposits, based on attempted leverage prior to a trade.

Future market stability

Bitcoin related derivatives offer hope for stability of bitcoin, which is already seeing some degree of leveling out in price. Bitcoin headed into 2015 with degree of volatility much lower than what it was used to in its earlier days. The CEO of BTC.sx did his own analysis of daily bitcoin prices to create a graph, which confirmed this, and showed a positive relation between volatility and trading volume. In the same article, a research fellow at George Mason University commented, “Bitcoin volatility has gone down because of the growing ecosystem. There are more sophisticated players who are doing more hedging and providing more liquidity to the market.” This shows a positive outlook for the Bitcoin infrastructure, as well the bitcoin currency.

Although Bitcoin-related derivatives have seen much growth and mainstream use, they still have room to grow in order to fully realize their market stabilizing potential. Firms currently offering these products are still working in an uncertain regulatory environment, leaving an opinion of underdevelopment for current derivatives. In context, even the early U.S securities market was chaotic before receiving needed regulation.

94 Ibid., sec. 2.
95 Metz, “The Next Big Thing You Missed.”
96 MONTERIO, “Flipping the (Bit) Coin.”
Regulation

Existing Regulatory Environment

Although sparse, Bitcoin regulation has come a long way. Current regulation predominantly comes from the US Financial Crimes Enforcement Network (FinCEN), US states, The Internal Revenue Service (IRS), the Securities and Exchange Commission (SEC) and the US Commodity Futures Trading Commission (CFTC)\(^{97}\).

FinCEN took part in the first wave of Bitcoin regulation, focusing on the realm of payments and money transfers\(^{98}\). The purpose of FinCEN is to protect consumers who may be susceptible to fraud under this focus. Leveraging the Bank secrecy act, FinCEN determined that Bitcoin Exchanges, as well as related firms, fit the classification of money transmitters. This classification mandates that such businesses register as money service businesses (MSBs) within states they operate, as well as comply with “know your customer rules”, file suspicious activity reports, and install anti-money-laundering programs\(^{99}\). For information on money transmitter laws by other states, statutes are available at [www.moneytransmitterlaw.com](http://www.moneytransmitterlaw.com), with a paid subscription\(^{100}\).

The various U.S states maintain law and regulations towards bitcoin. New York stands as one of the most assertive in this regard\(^{101}\). New York’s Department of Financial Services is currently going through rounds of comments on its proposed “BitLicense\(^{102}\).” Back in 2013, this same department issued subpoenas to over 20 bitcoin-related entities

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\(^{97}\) Ibid.; “Is Bitcoin Legal?”


\(^{99}\) Ibid., 153.

\(^{100}\) “Is Bitcoin Legal?”

\(^{101}\) “Is Bitcoin Legal?”

for information on their operations\textsuperscript{103}. Also, trusts are state regulated, and so an Electronically Traded Fund (ETF), like the Bitcoin Investment Trust, would be subject to common law and trust statutes\textsuperscript{104}.

The IRS has issued a brief statement on tax treatment for bitcoin holdings. According to this notice, bitcoin is treated as property under federal taxation\textsuperscript{105}. Raiborn and Sivitanides elaborate on this notice, stating that bitcoin holdings would be subject to “…implicit consequences of transactional capital gains\textsuperscript{106}.”

The SEC has jurisdiction over companies issuing securities. Thus ETFs, including the Bitcoin Investment Trust fall under its oversight and regulation, since they are now publicly traded\textsuperscript{107}. This carries requirements such as prospectus and filing mandatory financial statement audits\textsuperscript{108}. There are also stringent requirements regarding transparency and truthfulness in company statements\textsuperscript{109}. These are just a sample of the more pertinent regulatory requirements by the SEC.

The CFTC commonly has oversight over derivatives, but the way most derivative firms work exempts them from this, at least until further legislation has been enacted. With the high levels of risk involved in derivative contracts, the CFTCs purpose is to “…protect buyers and sellers of derivatives, and other participants in the derivatives markets, from fraud, market manipulation, abusive practices, and systemic risk\textsuperscript{110}.”

\textsuperscript{103} Brito, Shadab, and Castillo, \textit{Bitcoin Financial Regulation}, 153.
\textsuperscript{104} Brito, Shadab, and Castillo, \textit{Bitcoin Financial Regulation}, 175.
\textsuperscript{105} Aqui, “Internal Revenue Service Notice 2014-21.”
\textsuperscript{107} Casey, “BIT Poised to Become Publicly Traded Bitcoin Fund.”
\textsuperscript{108} Brito, Shadab, and Castillo, \textit{Bitcoin Financial Regulation}, 175.
\textsuperscript{109} Ibid.
\textsuperscript{110} Shadab, “Regulating Bitcoin and Block Chain Derivatives,” 3.
Contracts must be settled in cash for the derivative to fall under CFTC regulation\textsuperscript{111}. With that in mind, only TeraExchange is currently required and licensed with the CFTC\textsuperscript{112}. Other firms offering derivatives like BTC.sx are settled in bitcoin, and exempt from the CFTC for the time being\textsuperscript{113}. The CFTC has signaled a willingness to change this however. In December of 2014, the CFTC chairman, Timothy Massad stated that the CFTC has oversight over bitcoin derivatives. Massad based this statement on broad classification of commodities, while admitting specific rules haven’t been developed as yet\textsuperscript{114}. This is still important, as further regulation of these derivatives can improve investor confidence and improve their mainstream appeal.

**Outlook on Regulatory development**

The future of Bitcoin regulation will require open mindedness from regulators and the accounting profession. Open-minded approaches would avoid stifling Bitcoins’ innovative features. The accounting profession stands for principles that suggests a duty towards being the vanguard of Bitcoin regulation, in the way they can work with and enlighten regulators.

Regulation of transactions rather than the overall Bitcoin system has been suggested, to avoid infringing on the privacy and low cost structure\textsuperscript{115}. The cryptography used can serve as a model for other infrastructures in order to maintain information security. The low transaction costs can do wonder in countries lacking economic development and/or quality international remittance systems.

\textsuperscript{111} Brito, Shadab, and Castillo, *Bitcoin Financial Regulation*, 185.

\textsuperscript{112} Shadab, “Regulating Bitcoin and Block Chain Derivatives,” 12.

\textsuperscript{113} Ibid., 3.

\textsuperscript{114} Wong, “CFTC Chairman.”

\textsuperscript{115} Turpin, “Bitcoin: The Economic Case for a Global, Virtual Currency Operating in an Unexplored Legal Framework.”
Accountants should be at the forefront of regulation for such a system, as those who engage in the “language of business.” Bitcoin’s availability as a standalone investment, ETFs and derivatives calls for properly formulated reporting requirements and subsequently internal controls, which accountants have been best known for providing. However, there are no generally accepted accounting principles for Bitcoin, and this needs to be remedied, in order for the accounting profession to properly handle virtual currencies. In light of the circumstance, the New York State Society of CPAs formally approved a virtual currency task force, in early 2014. This sets a precedent that should be followed statewide, and internationally, to get the accounting profession up to date, or even ahead of virtual currency issues.

There is also a cost benefit analysis to keep in mind when creating Bitcoin regulation. The decentralized nature of Bitcoin makes it more difficult to regulate, than a centralized network. With millions of miners acting to verify payments rather than a single intermediary like visa, the costs of enforcement on the Bitcoin network as a whole can easily become exorbitant. Such a factor serves to emphasize the difference between control and regulation for policymakers. There are certain unchangeable realities of bitcoin, such as the peer to peer nature and irreversible transactions that should be taken into context when creating policies to improve its standing as an infrastructure and usefulness as a currency.

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116 Barry, “Accounting for Virtual Currencies.”
Conclusion

Bitcoins’ relevance to accounting has implications for accounting profession, Bitcoin framework and bitcoin currency. Bitcoin stands as the premier virtual currency framework, with signs of growth in use and offerings, as well as innovative characteristics. Accountants are poised to gain a better understanding of it, to stay adrift of the growing prevalence of technology in the way business is conducted. The financial value, growing liquidity, and technological implementations of Bitcoin are of relevance to what accountants do. With the issue of volatility easing, but still plaguing bitcoin, emerging bitcoin derivatives show potential to bring stability and further maturity of Bitcoin. However, this will require the guidance and participation of the accounting profession, to bring this potential to light, and continue the innovation and adaptability that has allowed Bitcoin to prosper thus far.
Appendix

Figure 1

![Diagram of how bitcoins work]

Miners create bitcoins by using computers to solve mathematical functions. The same process also verifies previous transactions.

Bitcoin exchanges will trade between conventional currencies and bitcoin, offering a way into the market for non-miners, as well as a way to cash out.

Users download a bitcoin wallet that works like an email address, providing a way to store and retrieve currency. Bitcoins can be transferred from one wallet to another using a web browser or a phone app.

Businesses create a wallet in the same way as an individual user, typically using a website button to enable a bitcoin payment. QR codes can be used to let customers pay quickly and easily.

Figure 2

<table>
<thead>
<tr>
<th>Signer's side</th>
<th>Verifier's side</th>
</tr>
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<tbody>
<tr>
<td><strong>Message</strong></td>
<td><strong>Verify</strong></td>
</tr>
<tr>
<td><strong>Sign</strong></td>
<td><strong>Public key</strong></td>
</tr>
<tr>
<td><strong>Private key</strong></td>
<td></td>
</tr>
</tbody>
</table>

118 “Bitcoin.”
Figure 3

Figure 4

119 28 and }, “Satoshi’s Genius.”
120 “Bitcoin Market Capitalization.”
121 “Bitcoin Number Of Transactions Per Day.”
Figure 5

Trading Volume VS Exchange Volatility

Source: CoinDesk “State of Bitcoin 2015”

123 “Bitcoin Could Impact Credit Unions, Report Says.”
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