Digital Currencies in Practice

Bitcoin's Potential for 2015

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Abstract

For the purposes of this paper, I am going to attempt to highlight the profound importance of decentralized ledger technologies. Specifically, I am going to address Bitcoin and its impact for the last few years.

In 2009 I was living out of my parent's basement, programming, and reading about new technology. I had corporate programming and management jobs — but I was hunting for something different. It was there that I stumbled across Bitcoin[1] and it has changed my life since.[2] For some reason I was afforded the opportunity to ride its wave; now I spend my time explaining its origins and significance.

Simply put, Bitcoin is an advancement in technology which rivals the internet for its importance to humanity. The Internet is a global means of relaying information; Bitcoin is the equivalent for relaying value. The major difference being that the Internet is about 35 years older than Bitcoin[3].

The major way by which they are similar is their reliance on a decentralized protocol. Decentralization is important to both the Internet and Bitcoin as it is what keeps humans from screwing them up.[4] It allows us to safely build the infrastructure needed for a global society.

My concept of a small society involves in-person interactions of communication, relationships, and trade. Both technologies can be thought of as a fabric which take what we do in that small society and makes those interactions possible across large distances. That fabric is possible in large part due to protocols. For the Internet it is TCP/IP[5] and for Bitcoin it is the Bitcoin protocol[6].

It would be much easier at this point in time for me to explain how the internet is important. Many people use the internet (42.3% globally, 87.7% North America[7].) The internet has become ingrained (and increasingly more so) into many people's everyday lives. So it is easy for me to argue that the Internet has improved humanity and that it is important.

It is difficult for me to explain Bitcoin's importance because many people do not use it yet. While it is not ingrained in most people's lives, it is very prominent in mine. It is difficult for me to argue Bitcoin's importance but I can point to ways by which I have seen Bitcoin used. I contend that these are better than ways where people don't use Bitcoin. Within this paper are some of those examples.

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[1] Nakamoto, S. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System*. Retrieved January 8, 2015, from https://bitcoin.org/bitcoin.pdf

[2] Waters, A. (2014, July 7). Bitcoin is just the beginning. Retrieved January 9, 2015, from http://www.ampedwebdesign.com/?p=256

[3] Cerf, V., Dalal, Y., & Sunshine, C. (1974). RFC 675. *SPECIFICATION OF INTERNET TRANSMISSION CONTROL PROGRAM*. Retrieved January 8, 2015, from http://tools.ietf.org/html/rfc675

[4] Gervais, A., Karame, G., Capkun, S., & Capkun, V. (2013). *Is Bitcoin a Decentralized Currency?* Retrieved January 8, 2015, from http://eprint.iacr.org/2013/829.pdf

[5] Internet protocol suite. (n.d.). Retrieved January 8, 2015, from http://en.wikipedia.org/wiki/Internet_protocol_suite

[6] Protocol specification. (n.d.). Retrieved January 8, 2015, from https://en.bitcoin.it/wiki/Protocol_specification

[7] World Internet Users Statistics and 2014 World Population Stats. (n.d.). Retrieved January 8, 2015, from http://www.internetworldstats.com/stats.htm

Technical Overview and History

Bitcoin is a fairly complex concept with many moving parts and seemingly conflicting definitions. It has technical, legal, financial, communal, and many other context-specific terminologies. The concepts touch on various fields of science and academic study. While this leads to a great deal of confusion and numerous points of argument and discourse — Bitcoin continues to work. There are areas of Bitcoin which are lacking but for many purposes it is useful. Often it works better than anything else — so we say it is good enough.[8]

A great deal of my time is spent trying to explain those complexities to varying groups. Why does Bitcoin work, and what does it mean to a specific group. One of the primary challenges is defining aspects of Bitcoin in a legal context. There is a draw to conflate Bitcoin subsystems and concepts with extant systems or parallel allegories. It is useful for us to first define some basic terminology so that we can avoid confusion with other domains.

'Bitcoin' with a capital B references the concept, system, ecosystem, industry, and everything that falls into the world of Bitcoin except for the unit of currency. 'bitcoin' or 'bitcoins' with a lower-case b delineates the unit of value, often referred to as a currency. These units are also referenced by symbols such as 'XBT', 'BTC', and ฿.[9]

The concept of Bitcoin can be considered an advancement in technology which solves several problems faced by academic computer scientists and mathematicians specializing in cryptology. The research — often referred to as "the white paper" — published by Satoshi Nakamoto proposes a decentralized ledger, secured and communicated by networks of peer-to-peer nodes. Subsequently, reference code was published to demonstrate the ways by which those nodes can communicate via a protocol to establish a decentralized digital currency.[10]

The terms centralized, decentralized, and distributed are often referenced when discussing Bitcoin. The terms are challenging to define because they have widely varying contexts. Outside of Bitcoin, there are some vivid examples as well. One such example is Paul Baran's IEEE communications research being referenced for the Nepalese constitutional development process.[11]

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[8] Swanson, T. (2014). *Bitcoin Hurdles: The Public Goods Costs of Securing a Decentralized Seigniorage Network Which Incentivizes Alternatives and Centralization*. Retrieved January 8, 2015, from http://www.ofnumbers.com/wp-content/uploads/2014/04/Bitcoins-Public-Goods-hurdles.pdf

[9] Bitcoin symbol. (n.d.). Retrieved January 8, 2015, from https://en.bitcoin.it/wiki/Bitcoin_symbol

[10] Bitcoind. (n.d.). Retrieved January 8, 2015, from https://en.bitcoin.it/wiki/Bitcoind

[11] Dhakal, P. (2009). The Law of Rule: Centralized, Decentralized and Distributed Systems. *Canada Foundation for Nepal*.
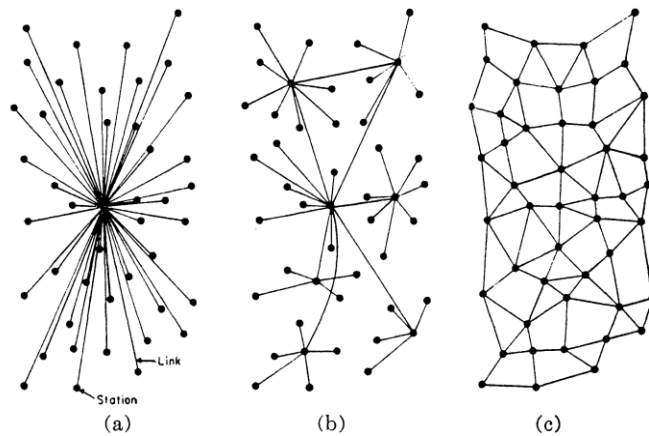
Fig. 1—(a) Centralized. (b) Decentralized. (c) Distributed networks. [12]

To explain the computer science context, here is a brief history of computers as it relates to these terms:

As far back as the 1800s, computer systems like Charles Babbage's interacted with remotely stored data — in that time it was punched cards.[13] These early computers can be considered centralized computers due to their primitive input/output devices being built-in and requiring a physically present operator.[14]

In 1965 the first personal computer, the Programma 101[15] was also centralized in that the operator was present and input/output was part of the unit. HP's version of the P101, called the HP 9100A (1968) had the following tagline in its marketing:

'Ready to relieve you of waiting to get on the big computer'

[16]

This byline is in reference to a series of problems at the time. Computers were large, expensive, scarce, and access to them was in high demand. The personal computer was one of the solutions to this problem, but there were other significant solutions in the 1950s and 1960s.

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[12] Baran, P. (1964). On Distributed Communications Networks. *IEEE Transactions on Communications, CS-12*(1), 2.
[13] Punched card. (n.d.). Retrieved January 28, 2015, from http://en.wikipedia.org/wiki/Punched_card
[14] Centralized computing. (n.d.). Retrieved January 28, 2015, from http://en.wikipedia.org/wiki/Centralized_computing
[15] Programma 101. (n.d.). Retrieved January 28, 2015, from http://en.wikipedia.org/wiki/Programma_101
[16] History of the 9100A desktop calculator, 1968. (n.d.). Retrieved January 28, 2015, from http://hp.com/hpinfo/abouthp/histnfacts/museum/personalsystems/0021/0021history.html

Batch processing (1950s) was a method for maximizing time spent on a computer by reducing idle time.[17] The concept was to create a stack of tasks for the computer to run rather than inputting them one at a time. Programmers would prepare programs for an operator rather than interact with the computer directly.

Time-sharing (1957) was the concept of a computer being accessed by multiple users simultaneously.[18] Previously it was an unworkable concept due to memory constraints needed to maintain the state of each user. Advancements in core memory and the development of computer terminals made it possible in the 1960s.

If we hold that a centralized computer system requires a present operator and built-in I/O — both time-sharing and batch processing systems broke out of the definition.

Computer terminals allowed multiple operators to interact with a computer system remotely.[19] While in many cases - remotely just meant in the next room. Still, this move created decentralized and distributed computer systems in that operators interfaced remotely (decentralized), or with a centralized operator (many-to-few distributed).

Columbia University SSIO terminal room (1986)[20]

These terms have long and steeped computer science history, and we've mostly touched on hardware configuration. There is still more definition within the contexts of network communications, software, permissions systems, government, and society. 30 years after the photo of Columbia's SSIO terminal room, we are found bridging the history of these terms with their contemporary meaning — and suffice it to say that they are generalized.

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[17] Batch processing. (n.d.). Retrieved January 28, 2015, from http://en.wikipedia.org/wiki/Batch_processing
[18] Time-sharing. (n.d.). Retrieved January 28, 2015, from http://en.wikipedia.org/wiki/Time-sharing
[19] Computer terminal. (n.d.). Retrieved January 28, 2015, from http://en.wikipedia.org/wiki/Computer_terminal
[20] The Columbia University Self Service Input/Output Area. (n.d.). Retrieved January 28, 2015, from http://www.columbia.edu/cu/computinghistory/ssio.html

Generally it is accepted that the Bitcoin concept is secured and effected by a network of nodes. The Bitcoin protocol serves as the rules of engagement for these nodes. Any deviation from the protocol is non-standard and is typically disregarded. The nodes are expected to cohesively agree or disagree on network transactions based on a pre-defined set of rules. In this way they form a relationship where they are otherwise unbound.

In practice, enactment of deviation happens on a fairly infrequent but planned schedule. Deviations are not effective unless the majority of the network decides that they are acceptable. In many ways it is a democracy such that positive deviations are implement by group consensus.

The digital currency is merely a reference to the utility of the decentralized ledger as a system of account. The units of which are typically called bitcoins, bitcoin, BTC, or XBT.

The units (bitcoins) can be sent from one party to another over the Bitcoin network in an atomic way. Sending these units is referred to as a transaction. It is overwhelmingly accepted that these transactions are for all intents of practice, irreversible.[21] In this way, the units cannot be fraudulently represented or counterfeit if standard measures are practiced.

In the early days of the system's use, bitcoins had little or no value. It was typical that academic economists, computer scientists, and cryptographers made up the community of users. They frequently gave bitcoins to one another for free.[22] The value of bitcoin was for research purposes.

Within a short amount of time, the number of users in the community rose, and the demand for bitcoin units rose. The supply of bitcoins is limited and finite[23] — and thereby scarce.[24] Demand outweighed the supply; thus began the process of price discovery.[25]

An example of this initial price discovery was a desire by one user for more bitcoin units, and the willingness of another user to send those units upon delivery of two pizzas. The amount of units exchanged was 10,000 bitcoins. This gave an approximate value of $0.0025 per bitcoin.[26]

As the number of users continued to grow — and correspondingly the demand for bitcoins — exchange services were created. Mt. Gox was the most prominent and it operated an open order book. It crossed buyers and sellers of bitcoins.[27] The price in USD at which supply met demand was widely accepted by the community to be the price of a bitcoin. From 2010 until February of 2014, Mt.Gox's price was commonly referred to as *the* price of Bitcoin with only a few exceptions.

[21] Böhme, R., Christin, N., Edelman, B., & Moore, T. (2014). Bitcoin. Retrieved January 8, 2015, from http://www.hbs.edu/faculty/Publication Files/15-015_2ef1a2dd-633d-494e-b47c-86cdc1dcad04.pdf

[22] Simonite, T. (2014, August 15). The Man Who Really Built Bitcoin. Retrieved January 8, 2015, from http://www.technologyreview.com/featuredstory/527051/the-man-who-really-built-bitcoin/

[23] Levin, J. (2014). *Creating a Decentralised Payment Network: A Study of Bitcoin*. Retrieved January 8, 2015, from http://www.scribd.com/doc/235838093/Creating-a-decentralised-payment-network-A-Study-of-Bitcoin

[24] The supply of bitcoins are typically constant in the short-term and asymptotically decelerating in the long-term.

[25] Controlled supply. (n.d.). Retrieved January 8, 2015, from https://en.bitcoin.it/wiki/Controlled_supply

[26] Pizza for bitcoins? (2010, May 22). Retrieved January 8, 2015, from https://bitcointalk.org/index.php?topic=137.msg1195#msg1195

[27] Mt. Gox. (n.d.). Retrieved January 8, 2015, from http://en.wikipedia.org/wiki/Mt._Gox

Today there are many competing exchanges and price indexes. Some of these indexes are up for review by the CFTC (LedgerX[28]) and one is even licensed as a SEF by the CFTC (Tera Exchange[29]). While other indexes such as the Winklevoss' WinkDex may be used to peg the price of Bitcoin for the securities they plan to sell on the NASDAQ.[30]

Today, Bitcoin is traded on many exchanges — both domestic[31] and international[32]. The prices and volumes are listed by several services.[33]

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[28] RELEASE: Pr7078-14. (n.d.). Retrieved January 8, 2015, from http://www.cftc.gov/PressRoom/PressReleases/pr7078-14
[29] RELEASE: Pr6698-13. (n.d.). Retrieved January 8, 2015, from http://www.cftc.gov/PressRoom/PressReleases/pr6698-13
[30] Winklevoss Bitcoin Trust. (2014, December 30). Retrieved January 8, 2015, from http://www.sec.gov/Archives/edgar/data/1579346/000119312514457552/d721187ds1a.htm
[31] Ex. Celery.com, Circle.com, Coinbase.com, and Coinsetter.com
[32] Ex. Bitfinex.com, Bitstamp.com, BTC-E.com, BTCChina.com, Kraken.com, and OKCoin.com
[33] Ex. Blockwork.com, Bitcoinity.org, Bitcoincharts.com, Bitcoinx.com, Winkdex.com, and Zeroblock.com

Remittance

I first began my understanding of remittance during my time at Bitinstant. Bitinstant was one of the first Bitcoin companies to exist, and was the largest Bitcoin company in the US - second only to MtGox globally. At its height, it moved several million dollars per week and employed 25+ people.[34]

My role in overseeing development was to make sure that it worked. Which it did from an engineering standpoint 98% of the time — but partner, banking, regulatory, and other legal issues created many problems — and ultimately led to the company's demise. During my time I was able to see up-close the utility of Bitcoin when used in a remittance context.

The basis is that if a person has bitcoins, they can be sent to anyone with internet access. Therefor, if a person converts cash into bitcoins, they can send those bitcoins to people in other countries with a de minimis fee. An amount of bitcoins worth $1 or $1,000,000 can be sent from a computer in New York to the computer in Pyongyang with a cost of seven cents. It would only take a few seconds to arrive, and it would be spendable after the Bitcoin network confirms the transaction (typically a few minutes.)

Bitinstant facilitated these types of transactions by establishing partnerships with services like Western Union and MoneyGram. People would use these services at locations like Duane Reade or CVS to send cash to Bitinstant — and end up with Bitcoin in a matter of minutes or sometimes a day later.[35] I have had many people tell me that they "purchased their first bitcoin with Bitinstant" because of how easy the service made it for people to gain access to the Bitcoin markets.[36]

There were several frictions which made Bitinstant so prominent. Prior to Bitinstant, it would take several days or weeks to setup an account on one of the handful of Bitcoin exchanges. It then took even more time to move money onto the exchanges. Another friction was that most of these exchanges were overseas and people did not trust their identity or financial information with foreign operators. In addition to market entrance, Bitinstant enabled the movement of funds between exchanges — which was useful to market arbitrageurs.[37]

Bitinstant capitalized on these market inefficiencies and was profitable. It highlighted the ease by which people could move money overseas. Cash was being moved for less cost to the consumer than other remittance systems — and it could reach anyone with an internet connection.

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[34] Taylor, C. (2013, May 17). With $1.5M Led By Winklevoss Capital, BitInstant Aims To Be The Go-To Site To Buy And Sell Bitcoins. *TechCrunch*. Retrieved January 8, 2015, from http://techcrunch.com/2013/05/17/with-1-5m-led-by-winklevoss-capital-bitinstant-aims-to-be-the-go-to-site-to-buy-and-sell-bitcoins/

[35] Roose, K. (2013, April 3). I Bought a Bitcoin: How I Joined a Virtual Currency Megabubble. *New York Magazine*. Retrieved January 8, 2015, from http://nymag.com/daily/intelligencer/2013/04/i-bought-a-bitcoin.html

[36] Roy, J. (2013, April 30). It's All About the Bitcoin, Baby. Retrieved January 9, 2015, from http://observer.com/2013/04/its-all-about-the-bitcoin-baby/

[37] Buterin, V. (2012, November 2). BTC Trader: Bitcoin Arbitrage Made Easy. *Bitcoin Magazine*. Retrieved January 9, 2015, from http://bitcoinmagazine.com/2672/btc-trader-bitcoin-arbitrage-made-easy/

Bitinstant operated in a time when it was difficult to acquire bitcoins. Since then, it has become much easier and I have yet to see a market player comparable to Bitinstant. The service profited from people getting into Bitcoin. It sparked the Bitcoin remittance market — which survives today without the frictions that made Bitinstant successful. It was a proof that demonstrated the ability of Bitcoin to be used for remittance.

This ability to send any value across the globe in seconds for a fee of a few cents is unprecedented.[38] It is profoundly impactful, particularly for migrant workforces — which send ~$400 billion across borders annually.[39]

Unfortunately, remittance is a major target for money laundering.[40] I became familiar with these concepts as Fincen was publishing guidance.[41] The guidance targeted companies like Bitinstant — and in all likelihood — the guidance was directed at Bitinstant.

Still, it is unconscionable that migrant laborers are paying 10-30% in fees when they are nearly twice as likely to be living below the poverty line in the United States.[42] I posit that Bitcoin will solve this problem, although it may take a few years. It will likely require the buildout of reporting infrastructure so that regulatory requirements can be satisfied. Or perhaps if the regulatory requirements are too stringent, we may see more operators go to jail and the legitimate cases for remittance will be pushed into black markets.

[38] Waters, A., & Shrem, C. (2013, May 28). General Assembly: What are Bitcoins? Retrieved January 8, 2015, from https://www.youtube.com/watch?v=kuk-SYSyqfM

[39] Andreesen, M. (2014, January 21). Why Bitcoin Matters. *DealBook*. Retrieved January 8, 2015, from http://dealbook.nytimes.com/2014/01/21/why-bitcoin-matters

[40] Money Laundering through Money Remittance and Currency Exchange Providers. (2010). Retrieved January 8, 2015, from http://www.fatf-gafi.org/media/fatf/ML through Remittance and Currency Exchange Providers.pdf

[41] Application of FinCEN's Regulations to Persons Administering, Exchanging, or Using Virtual Currencies. (2013, March 13). Retrieved January 8, 2015, from http://www.fincen.gov/statutes_regs/guidance/pdf/FIN-2013-G001.pdf

[42] Raphael, S., & Smolensky, E. (n.d.). Immigration and poverty in the United States. Retrieved January 8, 2015, from http://www.irp.wisc.edu/publications/focus/pdfs/foc262e.pdf

Regulatory Compliance

There is a strong sentiment in the Bitcoin community that laws are silly, and that they need not apply to Bitcoin. Still, the staunchest anti-state advocates clamour for legal protection when they are victimized. Their rhetoric speaks to many people's frustrations with government and society, and yet their actions go against what they preach.

To that end, I seek to help provide definitions so that the extant legal systems can make sense of Bitcoin. That being said, this debate is a major pressure point for Bitcoin.

For now, my esteemed friends practiced in law need temporary or good-enough definitions so that Bitcoin can be addressed in a legal context. Just as cars were initially called horseless carriages - it is likely that our understanding of Bitcoin and the applicable terminology will evolve.

The internet has caused for a great deal of revision to our legal system — I believe digital currency will have a similar effect. The following is a breakdown of the regulatory groups which affect Bitcoin most in the United States currently. This section is fresh, and will need a great deal of updates — I'm sure there was a great deal which has been unintentionally left out. Please check back at Waters.nyc for updates.

FinCEN
The Financial Crimes Enforcement Network was a first mover to take a stance on Bitcoin. It defined most existing Bitcoin business activity as money transmission. This required many Bitcoin businesses to register as a money service business and comply with the requirements to file SARs, CTRs, FBARs, and funds travel reporting. Treasury's BSA regulation was given guidance by FinCEN relating specifically to digital currency in March 2013.[43] To a great extent, this curtailed money laundering and established an audit trail for law enforcement — the value of which comes at a cost to businesses innovating in the space. FinCEN was faced with the challenge of being the first regulator to take a stance on Bitcoin. Their guidance aired on the side of preventing money laundering — which made sense at the time — and was much better than an outright ban on Bitcoin.

Simultaneously, many already registered MSBs can only interact with other registered MSBs for various types of transactions. If Bitcoin companies wanted to interact with traditional systems, they would have to register — and FinCEN took steps to guide that transition.

A potentially unexpected consequence was that banks would have to grant the compliant businesses a more specialized bank account. This required the compliant Bitcoin businesses to apply for additional due diligence with bank compliance departments — and make more disclosure about the type of business they were conducting. The poor timing of the financial crises in 2008 has led banks to be leary of additional compliance risks and these MSB bank account applications were largely denied. There

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[43] Application of FinCEN's Regulations to Persons Administering, Exchanging, or Using Virtual Currencies. (2013, March 13). Retrieved January 8, 2015, from http://www.fincen.gov/statutes_regs/guidance/pdf/FIN-2013-G001.pdf

were and still are very few bitcoin companies who have an MSB bank account with a US bank. To my knowledge, none have been granted by any of the largest US banks.[44]

FinCEN's guidance that many Bitcoin businesses are money transmitters led to another interesting problem. Federally registered money transmitters are required by many states to register locally for state money transmission licenses wherever they conduct business. Most Bitcoin companies are internet-based and therefore would be subject to the jurisdiction of all 50 states. At the time, there was little or no guidance by states regarding Bitcoin. This is still an area of development with a great deal of research being done by groups like NYDFS and CSBS.

Coin Validation sought to bridge information to the existing Bitcoin businesses and share what had been learned at Bitinstant. It created tools to satisfy the reporting, recordkeeping, and KYC/AML/EDD [45] requirements of the BSA. The intent being to save time and money on behalf of the businesses faced with this new regulation. Unfortunately the messenger was shot — and CV was shelved.[46]

Much of the Bitcoin industry moved overseas — and a large part of the innovation has remained foreign — the barrier of entry in the US is steep due to the cost of compliance and lack of banking availability.[47]

IRS
The Internal Revenue Service was compelled by the GAO in May of 2013 to take a stance.[48] Subsequently, the IRS classified Bitcoin as property in most contexts in March of 2014.[49] It made exceptions for salaries paid in bitcoin and proceeds generated from mining — which it classified as taxable income. This came as a relief to many investors as the capitals gains tax on bitcoin value appreciation is lower than if it had been classified as ordinary income.[50]

SEC / FINRA
Statements regarding the risks surrounding Bitcoin have been issue by both The U.S. Securities Exchange Commission[51] and the Financial Industry Regulatory Authority[52]. Unregistered securities

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[44] Straus, R. (2013). The FinCEN virtual currency guidance: Neutering Bitcoin? Retrieved January 8, 2015, from http://www.riddellwilliams.com/uploads/pdf/articles/article20130415-fincen-efplp.pdf

[45] Know Your Customer, Anti-Money Laundering, Enhanced Due Diligence

[46] Buterin, V. (2013, November 15). Anti-Theft Bitcoin Tracking Proposals Divide Bitcoin Community. Retrieved January 9, 2015, from http://www.coindesk.com/bitcoin-tracking-proposal-divides-bitcoin-community/

[47] Straus, R., Adler, R., & Waters, A. (2014, December 2). The Digital Currency Roundtable - 19th November 2014. Retrieved January 9, 2015, from https://www.youtube.com/watch?v=xyqUslBibOA

[48] Cabou, J., Eisenberg, G., Eiting, B., Miller, K., & Ness, L. (2014, January 1). The Legal Landscape of Bitcoins And Other Virtual Currencies: #ing Your Way Through Licensing, Regulatory, Tax and Other Issues. Retrieved January 9, 2015, from http://www.acc.com/chapters/gny/upload/ACC-GNY-Presentation-FinalPerkinsCoie.pdf

[49] IRS. (2014, March 25). Notice 2014-21. Retrieved January 9, 2015, from http://www.irs.gov/pub/irs-drop/n-14-21.pdf

[50] Bradbury, D. (2014, March 26). What the IRS Bitcoin Tax Guidelines Mean For You. Retrieved January 9, 2015, from http://www.coindesk.com/irs-bitcoin-tax-guidelines-mean/

[51] SEC. (2014, May 7). Investor Alert: Bitcoin and Other Virtual Currency-Related Investments. Retrieved January 9, 2015, from http://investor.gov/news-alerts/investor-alerts/investor-alert-bitcoin-other-virtual-currency-related-investments

[52] FINRA. (2014, May 7). Investor Alert - Bitcoin: More than a Bit Risky. Retrieved January 9, 2015, from http://www.finra.org/Investors/ProtectYourself/InvestorAlerts/FraudsAndScams/P456458

became increasingly sold for Bitcoin — and the SEC took action against issuers in 2014.[53] Ponzi schemes have also been prosecuted.[54]

CFTC

The US Commodity Futures Trading Commission is taking a gamble on Bitcoin companies. It has approved a swap execution facility which ties delivery to an approved bitcoin price index.[55] The reluctance by the CFTC stems from the highly speculative nature of Bitcoin — where there is a high potential for market manipulation. Fortunately this is a chicken and egg problem where CFTC's approval of exchanges will give greater recourse for manipulation — and in my opinion reduce its effects. Products falling under their regulation will bring stability to bitcoin markets as a hedge against the risk of volatility.[56]

State agencies

New York and California have been most publicly prominent in their pursuit to understand Bitcoin. The Bitlicense proposal[57] by NY superintendent of financial services Benjamin Lawsky is a proposed regulatory framework geared for digital currency. It is open to public comment and has gone through several revisions since its introduction in 2014 by the New York Department of Financial Services.[58] An interesting development being the commentaries from fortune 500 companies which were surprisingly made public.[59]

Treasury

In March of 2014, David Cohen — the undersecretary for terrorism and financial intelligence at the Unite States Department of the Treasury — stated that virtual currencies are not leading to widespread criminal use.[60] Plans to engage[61] in a discussion with regards to the difficulty Bitcoin companies face with banking have been proposed[62] in response to Treasury's planned round table on January 13th 2015. [63]

[53] SEC. (2014, December 8). SEC Sanctions Operator of Bitcoin-Related Stock Exchange for Registration Violations. Retrieved January 9, 2015, from http://www.sec.gov/News/PressRelease/Detail/PressRelease/1370543655716

[54] SEC. (n.d.). Investor Alert - Ponzi schemes Using virtual Currencies. Retrieved January 9, 2015, from http://www.sec.gov/investor/alerts/ia_virtualcurrencies.pdf

[55] Massad, T. (2014, December 10). Testimony of Chairman Timothy Massad before the U.S. Senate Committee on Agriculture, Nutrition & Forestry. Retrieved January 9, 2015, from http://www.cftc.gov/PressRoom/SpeechesTestimony/opamassad-6

[56] Bernstein, B. (2014). POTENTIAL REGULATION OF BITCOIN BY THE CFTC. *American Conference Institute*.

[57] NYDFS. (2014, July 1). VIRTUAL CURRENCIES. Retrieved January 9, 2015, from http://www.dfs.ny.gov/about/press2014/pr1407171-vc.pdf

[58] Liu, A. (2014, January 30). The US Government Closes In On Bitcoin, And Some Bitcoiners Are Smiling. Retrieved January 9, 2015, from http://motherboard.vice.com/blog/the-us-government-closes-in-on-bitcoin-and-some-bitcoiners-are-smiling

[59] Macheel, T. (2014, December 18). Lawsky Outlines Revisions to New York's BitLicense in DC Speech. Retrieved January 9, 2015, from http://www.coindesk.com/lawsky-outlines-revisions-new-yorks-bitlicense-dc-speech/

[60] Dougherty, C., & Farrell, G. (2014, March 18). Treasury's Cohen Sees No Widespread Criminal Bitcoin Use. Retrieved January 9, 2015, from http://www.bloomberg.com/news/2014-03-18/treasury-s-cohen-says-regulation-helps-virtual-currencies.html

[61] Marston, D. (2015, January 5). Digital Chamber Seeks Comments From Industry on Access to Banking Services. Retrieved January 9, 2015, from http://www.digitalchamber.org/assets/press-release---roundtable-.pdf

[62] Inside Bitcoins. (2015, January 6). U.S. Treasury to Hear Bitcoin Industry Issues Related to Banking. Retrieved January 9, 2015, from http://insidebitcoins.com/news/u-s-treasury-to-hear-bitcoin-industry-issues-related-to-banking/28416

[63] Treasury Department. (2014, December 22). Dodd-Frank Wall Steet Reform 295 in the last year. Retrieved January 9, 2015, from https://www.federalregister.gov/articles/2014/12/22/2014-29928/notice-of-roundtable-discussion-on-financial-access-for-money-services-businesses-msbs

OCC

While the Office of the Comptroller of the Currency has not to my knowledge make public statement on Bitcoin, pursuit of a federally chartered bitcoin bank has been abandoned by several parties. This is in part due to the unlikelihood of a federal bank charter for a Bitcoin entity.[64] The number of OCC regulated institutions has sharply declined since Dodd-Frank.[65] A Bitcoin bank is unlikely to emerge as "source of strength" and other guidance is only recently being explored.[66]

CFPB

The Consumer Financial Protection Bureau issued guidance against the risks of Bitcoin in August of 2014.[67] Additional statements were made that the CFPB is monitoring the development of virtual currencies.[68]

DOJ

In the senate homeland security and governmental affairs committee hearing on digital currencies in November 2013, the following was stated in testimony:

> "I feel confident that we have the tools that we need to address these threats and I feel confident
> that we have the will to address those threats, but we need to keep pace with what is going to
> come" — Mythili Raman

At the time, Mr. Raman was the assistant attorney general in the criminal division of the Department Of Justice. [69]

[64] Orsini, L. (2014, October 27). What It Will Take For You To Get Bitcoin At The Bank. Retrieved January 9, 2015, from http://readwrite.com/2014/10/27/bitcoin-banks-regulation

[65] Curry, T. (2014, September 9). TESTIMONY OF THOMAS J. CURRY COMPTROLLER OF THE CURRENCY before the COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS. Retrieved January 9, 2015, from http://www.occ.gov/news-issuances/congressional-testimony/2014/pub-test-2014-122-written.pdf

[66] Long, A., Muckenfuss, C., Cannon, K., Acree, A., & Richard, C. (2013, September 3). LIMITED PURPOSE BANK CHARTERS FOR COMMERCIAL FIRMS: THE END OF THE DODD-FRANK MORATORIUM. Retrieved January 9, 2015, from http://www.gibsondunn.com/publications/Documents/Limited-Purpose-Bank-Charters-for-Commercial-Firms-End-of-Dodd-Frank-Moratorium.pdf

[67] CFPB. (2014, August 1). Risks to consumers posed by virtual currencies. Retrieved January 9, 2015, from http://files.consumerfinance.gov/f/201408_cfpb_consumer-advisory_virtual-currencies.pdf

[68] Lee, J., Long, A., Steiner, J., & Handler, S. (2015, January 5). DEVELOPMENTS IN VIRTUAL CURRENCY: REGULATION AND ENFORCEMENT ACTIONS GAIN MOMENTUM. Retrieved January 9, 2015, from http://www.gibsondunn.com/publications/Documents/Developments-in-Virtual-Currency--Regulation--Enforcement-Actions-Gain-Momentum.pdf

[69] Vinik, D. (2013, November 19). Bitcoin Love Fest Takes Place At The Senate. Retrieved January 9, 2015, from http://www.businessinsider.com/bitcoin-love-fest-takes-place-at-the-senate-2013-11

Sections regarding the following topics are intended for future revisions as this is a living document:

Tokenization, Securities, & Commodities
Store of Value
Payments
Escrow & Custody
Settlement
Fungibility
Privacy, Transparency, & Trust
Risks
And More…

All of the material contained herein is fresh, and will need updates — I'm sure there is material which has been unintentionally left out or is in error. Please submit commentary or revisions to alex@coin.co and check back at Waters.nyc for future revisions.