

Testimony of Mark T. Williams¹
Banking Specialist, Commodities and Risk Management Expert
Boston University Finance Department
To The New York State Department of Financial Services
January 28-29, 2014
Hearing Regarding Virtual Currencies
90 Church Street
New York City, New York

Executive Summary

Since 2009, over seventy-five virtual currencies have been created and are traded globally representing about \$11 billion in stated market value. <http://coinmarketcap.com/mineable.html>. Of these e-currencies, Bitcoin is the leader represents about \$10 billion or over 90 percent of total industry market value. Based on its volatile price behavior, **Bitcoin is not a virtual currency but a high-risk virtual commodity, in a hyper-asset bubble that has begun to pop.** Bitcoin the pseudo currency and Bitcoin the low-cost payment system are dependent on each other and inseparable.² Over the last year, Bitcoin prices have been artificially inflated through an oligopolistic ownership structure, extreme hoarding practices, unregulated e-exchanges, marketing hype and greater opportunity for market manipulation. The trust and integrity associated with the U.S. Dollar as a transactional currency has been earned over centuries and supported by ongoing monetary and fiscal policy, soundness of central banking systems, regulation and enforcement.³ There are significant risks and uncertainties associated with virtual currencies that need to be fully measured before they are allowed to proliferate further or be adopted into the financial system. **Bitcoin presents numerous market related risks as it is decentralized, volatile, untraceable, unregulated, and provides no legal protection for consumers.** If Bitcoin, in its embryonic stage, were to replace the U.S. dollar, it would be economically disastrous causing trade to plummet, GDP to fall and unemployment levels and bartering to surge. **Bitcoin is an experiment that needs to remain in the laboratory until it can meet the basic standards required to become a beneficial transactional currency.** As a virtual commodity, Bitcoin remains extremely risky and needs to be closely watched. To transform Bitcoin into a virtual currency would require regulation, centralization, creation of a legal framework and strong regulatory oversight. However, these steps alone would not necessarily guarantee that chronically high price volatility would drop low enough to allow Bitcoin to become a trusted transactional currency.

In conclusion, I hope this testimony will provide additional insight and spur further research and analysis into virtual currencies and the growing risks they pose to U.S. investors, the financial system and to the overall global economy if not properly managed.

¹ Mark T. Williams has no direct or indirect financial interest in either Bitcoin, Bitcoin-related startups or any other

² Bitcoin is the equivalent of the locomotive while the payment system is the rails that allow it to move. If the engine does not work no matter how well built the rails, they won't be used.

³ The Federal Reserve Bank was founded in 1913.

I. Background

My name is Mark Williams. For the last decade I have taught banking, finance and capital markets at Boston University. My areas of expertise include banking, risk management and commodity trading. Of particular interest is evaluating market bubbles and potential market manipulation schemes. In 2010, through McGraw Hill, I published Uncontrolled Risk, www.uncontrolledrisk.com, a book about the fall of Lehman Brothers and the major factors that caused the real estate bubble.

Prior to Boston University, I was a senior trading floor executive at Citizens Power LLC, a Boston-based commodity-trading firm. Other work experience included stints at the Federal Reserve Bank as a field examiner in Boston and San Francisco. Through my academic and work experiences I have gained a strong understanding of how the capital markets function, the vital role of currency, how financial institutions operate, and how manipulation schemes can be used to distort market prices and harm unsuspecting investors.

For the last year, I have closely followed, evaluated and more recently written on Bitcoin, its market structure and its highly unusual price run-up. During this period it has become increasingly apparent that **structural weaknesses have caused inefficiencies providing greater opportunity for market manipulation**. In this regard, I also bring this matter to your attention for further consideration and review.

II. Creation of Bitcoin

In 2009, a programmer or group of programmers by the pseudo name Satoshi Nakamoto⁴ supposedly designed Bitcoin, a computer generated “virtual currency” produced by solving progressively complex mathematical puzzles.⁵ The code-protocol for Bitcoin is open source, allowing it to be easily viewed, commented on and if a majority of programmers agree, changes are adopted. In this regard, Bitcoin is very transparent.⁶ The Bitcoin infrastructure that includes a payment system is decentralized and based on a peer-to-peer structure. Individuals in numerous locations, using powerful computers to solve predetermined equations, authenticate e-coins and help keep a general ledger of ongoing transactions. This blockchain ledger provides a visible record of all past, current and all future transactions. For their efforts, puzzle solvers are rewarded with blocks of e-coins. This process is referred to as mining and those that do it are called miners. Interestingly, using such terminology also gives the false impression that something of tangible value is being created such as gold being mined out of the ground. Some enthusiasts have claimed that Bitcoin is gold for geeks. Initially, the barrier to entry to become a miner was low. As time has passed this barrier has risen and those who are already mining have a competitive advantage and

⁴ This individual (or group of individuals) has never stepped forward to take credit for his work adding to the mystery and mystique but raises the question does this person actually exist. However, others such as Gavin Andersen have stepped forward serving as the Chief Scientist on the board of the Bitcoin Foundation.

⁵ Bitcoin has not been recognized by any of the G20 countries as meeting the definition of currency as it lacks price stability and does not provide a stable store of value. As a result it is a speculative virtual commodity with no tangible value.

⁶ The Bitcoin community has argued that this open source approach is a strong control as it allows a large community of computer scientists, software engineers and cryptologists to watch over the system and insure its integrity.

greater market power.⁷ To gain a competitive edge, some miners have moved their operations to Iceland to take advantage of the lower cost of geothermal power.

Initially, miners were rewarded with 50 coins per block. More recently, a block is equal to 25 coins. The coin/block ratio will continue to half as time goes on. It takes approximately 10 minutes to mine a block and approximately 4,000 new e-coins are generated globally per day. Presently, over 12.3 million Bitcoins have been minted and by year 2140, the maximum limit of 21 million will be reached. Prescribed quantity limitations create a scarcity that has put upward pressure on prices. This pricing influence works as long as new investors can be recruited to buy newly minted e-coins.

Theoretically, the Bitcoin mining and authenticity process is decentralized, keeping collusion between miners to a minimum. However, in practice, **as prices have skyrocketed, there has been greater economic incentive for miners to ban together in pursuit of greater profits. As a result, this remains a clear weakness in the Bitcoin infrastructure.**⁸ As new e-coins are minted they are added to the blockchain and when trades occur, existing e-coins are authenticated against this blockchain. As more Bitcoins are mined, the blockchain grows longer in complexity and the verification time increases.

III. Why Investors Are Motivated to Buy Bitcoin

What convinces individuals to exchange real money for fake or digital money? **Bitcoin is an unusual investment choice as it has no tangible value and is not backed by anything.**⁹ Presently, Bitcoin prices have shot up not because of underlying value but because of misinformation, concentrated market power, hoarding, opaque and unregulated exchanges, insufficient trade reporting, elevated marketing hype and greater opportunities for market manipulation.

In addition to mining or buying Bitcoins on e-exchanges, investors can now buy them from Bitcoin ATMs. Such machines are popping up around the globe in alarming numbers. All that is needed prior to investing is to setup an e-wallet account. **With increased ease and access to buying Bitcoins, also comes greater risk to uninformed and less sophisticated investors.** To minimize investor losses, regulation covering Bitcoin ATM buying also needs to be quickly established.

a. What is the Value Proposition?

Bitcoin is not a company where investors can own stock. It is not incorporated, has no CEO, management or a board. It is a concept, an experimental idea, its source code is public and its intellectual property is given away for free. Since inception, Bitcoin has been promoted as a disruptive technology, a virtual payment system and a means to take control away from

⁷ On a per coin basis, the estimated cost (time and energy usage) of mining Bitcoins has increased to the \$10 to \$14 range.

⁸ Last month a group of miners by the name of Ghash.io demonstrated this system weakness by pooling their computing power to form one supercomputer and showing how to circumvent the decentralized structure and gain 51 percent control.

⁹ Unlike conventional currencies that are backed by the full faith and taxing power of the issuing sovereign.

irresponsible central bankers and return the power of currency creation to the people. Some Bitcoiners have even compared the coin's birth to the start of the internet revolution. Others have called this period the Bitcoin Revolution.

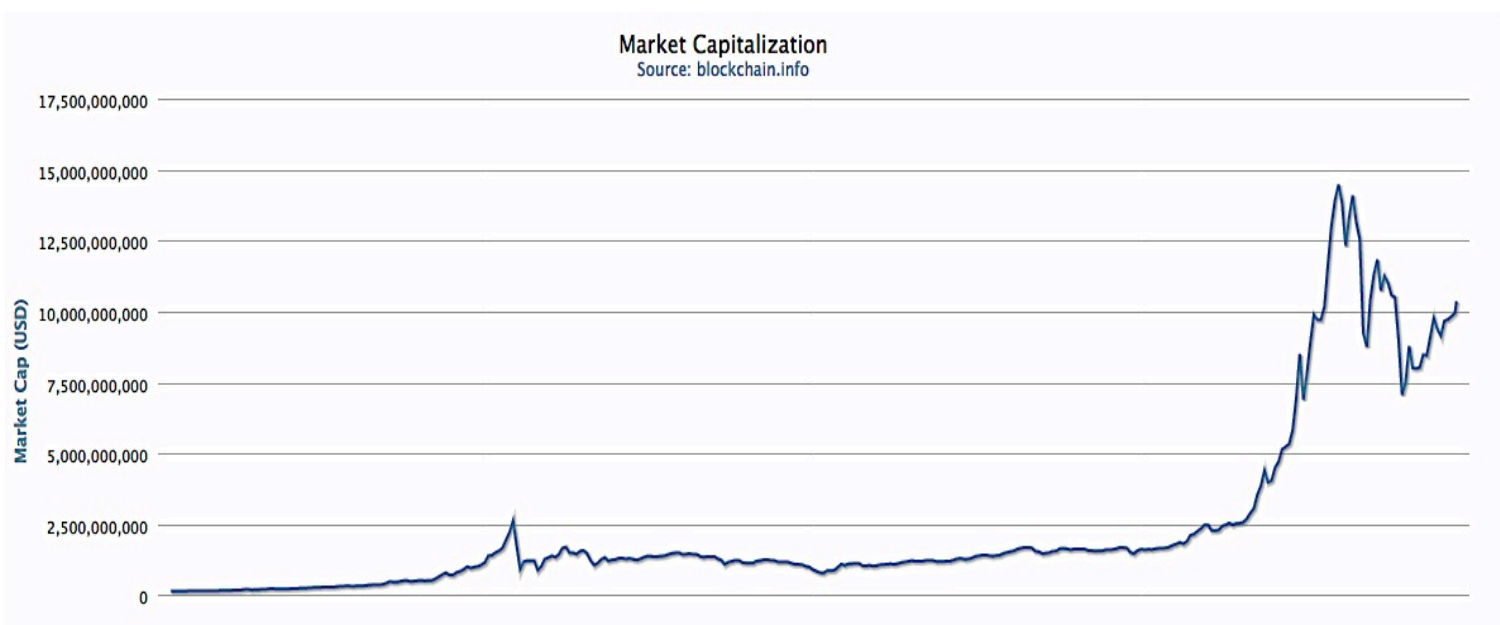
Added factors have enticed investors including rapidly rising prices as well as the mystique associated with the programmer or group of programmers using the pseudo name Satoshi Nakamoto. It is puzzling that few investors have questioned why he (or group of programmers) has not publically stepped forward. Could this be an elaborate hoax to hype investor demand or is it a calculated risk management maneuver to shield the creator from legal liability if the invention is used for unlawful purposes?

Regardless of the reason, investor appetite for Bitcoin remains strong. In general, investor rationale has fallen into the following five categories:

1. Virtual currency – It can't be manipulated by central bankers, has finite quantity and when adopted as a world currency it will have immense value.
2. Virtual commodity – Buy Bitcoin and profit from scarcity of supply of a good that will be in great demand.
3. Payment system – Bitcoin is a payment system that will replace Visa, Mastercard and Western Union.
4. Ownership – Buying Bitcoin is like buying into an internet startup venture.
5. Political Statement – Buying Bitcoin is a vote against central bankers and failed policy that has undermined our economy.

IV. Bitcoin is a Virtual Commodity and **not** a Virtual Currency

Although Bitcoin was purportedly designed as a virtual currency, it is a highly-speculative virtual commodity. Since 2013, prices have skyrocketed from \$13 to a December market peak of \$1,200. Currently, Bitcoin trades for about \$850. There is no major currency on the planet that exhibits this sort of price pattern.



a) Why Bitcoin is not a Virtual Currency

Useful transactional currencies are to be saved, lent or spent but not hoarded. Transactional currencies exhibit low price volatility while tradable commodities tend to exhibit high to extreme price volatility. By definition, a currency should have price stability and provide a means of stored value. Faith in and the use of currency for daily activities is a key pump that drives economic prosperity. If a currency has the potential to increase greater than the goods it can buy, owners will naturally hoard the currency over ownership of goods. Hard currencies such as the U.S. Dollar, British Pound Sterling and the Euro exhibit low price volatility, providing a dependable means to transact commerce. Gross Domestic Product or GDP is a key economic measurement used to measure goods and services produced. United States, the world's largest economy, has an annual GDP of approximately \$15 trillion. If extreme price movements in the U.S. dollar caused its use to fall, commerce would decline, causing GDP and per capita income to also decline. In a contracting economy, unemployment rates rise. In extreme situations, if currency is perceived as having significant appreciation potential, it will be hoarded.

1. Extreme Hoarding

Unlike useful transactional currencies, holders of Bitcoin practice extreme hoarding. Currently, of the approximately 12.3 million e-coins produced, over 90 percent are hoarded and not used (or available) for commerce. The significant daily price fluctuation of Bitcoin including its rapid appreciation, and extreme annual volatility, undermines its ability to serve as a stable, safe and trusted transactional currency.

If the U.S. were to adopt Bitcoin in its current embryonic state as a parallel currency and the same level of hoarding was practiced, it would be economically disastrous, for U.S. trade, the banking system, GDP, standard of living and overall level of employment. Trade would decline as holders of currency would use it as a commodity to speculate and not as a means for transacting business. Given that the U.S. dollar is the world reserve currency with over \$1.2 trillion in circulation, it would also have a significantly negative impact on global economy and trade.

2. Tax Implications

Given the high price run-up in Bitcoin, there are significant tax considerations that also influence the level of hoarding versus spending. If an e-coin was purchased for \$500 and it now trades for \$850, (a \$350 taxable profit) the owner is going to be less motivated to use it for transactional purposes, especially if doing so would trigger a tax event. Globally, tax treatment uncertainty persists, as countries are just starting to establish tax rules for virtual currencies. In general the decision will come down to taxing e-currency income either at current income or at capital gains tax rates.

V. Hyper Price Volatility

In 2013, Bitcoin increased in price by an astonishing 9,000 percent with 150 percent price volatility. In comparison, the U.S. dollar to other hard currencies typically exhibits an annual price movement in the 10 to 12 percent range. To provide perspective, Bitcoin is 7 times more volatile than gold and 8 times more volatile than the S&P 500 Index. In recent months, prices have been on a rollercoaster dropping by 30 percent since the market high. It is not uncommon for daily prices to move by 20 or 30 percent. During the second week of December 2013, in a 48 hour period, prices plummeted by 50 percent only to rise again two weeks later. Since the December low of approximately \$535, Bitcoin has gained about \$300.

1. Well Established Retailers are not Willing to Accept Bitcoin Price Risk

High daily price risk presents a major hurdle for the adoption of Bitcoin as a viable virtual currency. Large retailers work on tight margins sometimes as little as 10 to 15 percent. Given that daily price movements can be two times greater, a sudden price drop could wipe out retailer profits and even generate a significant loss. **Technically, at present levels, if a large retailer were to accept Bitcoin price risk directly, they would no longer be in the retail business but in the high-risk commodity trading business.** If a publically traded company, shareholder could revolt.

2. Increased Concentration Risk to Financial Middlemen – Growing Regulatory Concern

Given the high daily price risk associated with Bitcoin, retailers have been hesitant to assume this significant market risk. In response, several Bitcoin startups including BitPay and Coinbase have emerged. These financial middlemen sit between customer and retailer, fixing the Bitcoin exchange rate prior to sale. When using such middlemen, retailers might advertise they take Bitcoin, even posting a sticker on their doors, but technically, they are not taking Bitcoin, they are taking U.S. dollars. **Importantly, these types of financial arrangements do not reduce overall market risk but simply concentrates this risk.** Theoretically, if these hard-currency payments are coming directly from the financial middlemen, retailers should be indifferent. However, BitPay and Coinbase have limited balance sheets that restrict the amount of market-price risk they can (and should) safely warehouse. Using current price history, a single day drop of 20 percent on a large enough position could be financially devastating, even causing bankruptcy for these middlemen if not properly managed. Moreover, a derivatives market that would normally help such firms offset or hedge-out this risk has not yet materialized.

Given the growing concentration risk to financial middlemen such as BitPay and Coinbase, and the significant market disruption that would occur by even one firm bankruptcy, regulators will need to rapidly establish prudent minimum capital requirements especially if retailer demand for using such thinly capitalized intermediaries grows.

3. Virtual Commodity Risk

As a virtual commodity, Bitcoin remains an extremely risky investment and needs to be closely watched¹⁰. Speculative interest has increased as prices have risen. Many of these investors are U.S. Citizens. Rapidly those that previously mined coins as well as new groups of investors have become speculators. In a perverse way, inflated prices have been used to validate the Bitcoin investment thesis instead of reliance on fundamental analysis, data and hard facts to arrive at a fair market value. Lack of analyst coverage has also inhibited the quality and quantity of market research available before making investment decisions¹¹.

VI. Could Bitcoin be transformed into a virtual currency?

It is plausible that Bitcoin could be transformed into a virtual currency but it would need to be significantly modified so it encouraged greater transactional use, circulation and less hoarding. Freicoin, a relatively new pseudo currency has attempted to solve this hoarding problem by charging holders a fee, after a set number of days, if the coin has not been used.¹² Present daily, weekly, monthly and annual price swings of Bitcoin have to fall substantially. For example, Bitcoin's annual price volatility would have to drop at least 10 fold, (10 to 15 percent range) from its current stratospheric level of 150 percent. Last, greater regulation, centralization, creation of a legal framework and strong regulatory oversight would also need to be put in place. In this "wild-west" trading atmosphere tighter controls over global e-exchanges and participants would also have to be implemented in an attempt to further discourage market manipulation.

VII. Bitcoin is in a Hyper Asset Bubble That Has Begun to Pop

In an efficient capital market, capital flows to its highest and best use as investors seek tradeoffs between desired risk and desired return. When investors receive timely, accurate and transparent information, the likelihood of an asset bubble is diminished. However, even in efficient, seasoned and well-developed financial markets it is not uncommon to experience bubbles (e.g., Dotcom 2001, Real Estate 2007/8). Historically, asset bubbles have three phases: growth, maturity and pop. Not all bubbles experience rapid price collapses, sometimes prices deflate over an extended period, allowing investors to experience lower losses when exiting¹³.

Bitcoin was created in 2009, hitting its growth stage in 2011 and maturity stage in 2013. The pin that began to pop the Bitcoin bubble was the central bank of China decision in December 2013 to crackdown on e-currency. Prices remain about 30 percent lower since this significant market news.

The recent hyper-price run up, investor expectations of a quick gain, weaknesses in efficient market mechanics and increased opportunities for market manipulation have contributed to the Bitcoin asset bubble. **When the Bitcoin hyper-bubble bursts, prices could drop below \$10 as soon as**

¹⁰ The U.S. Commodity Futures Trading Commission would be a logical regulator to oversee the commodity attributes of Bitcoin.

¹¹ Bank of American/Merrill Lynch began coverage in December 2013 stating Bitcoin could rise to \$1,300 while Citigroup indicated it could not substantiate the value of Bitcoin.

¹² This fee is paid to e-coin miners.

¹³ Investor/speculators can make money in all three phases of an asset bubble.

June of 2014. This bubble burst prediction has been detailed in several articles, one of which published in December 2013 is attached (<http://read.bi/1czm9bz>). **If such a price collapse did occur, it would further undermine investor trust and immediately jeopardize the chances of Bitcoin being adopted as a virtual currency.**

The final driving force that will burst the Bitcoin bubble is growing investor awareness that what they bought has greater risk and uncertainty than anticipated. Regulation hearings such as the one being held by the New York State Department of Financial Services on January 28 and 29th of 2014 will also assist Bitcoin investors in better understanding what they are or are not buying. Examples of risks that once factored in will push Bitcoin prices down include a growing regulatory climate, greater oversight, decreased opportunities to influence Bitcoin prices, challenges associated with commercialization, reputational risk linked to illicit activities (e.g, Silk Road), competitive pressure from better designed e-currencies, evidence that existing markets are rigged against smaller investors and/or disclosure of market manipulation.

VIII. Dangerously High Potential for Market Price Manipulation

As a rapidly developing decentralized market with no regulation and oversight, and as profit opportunities increase, the motivation to influence prices has also increases. **The Bitcoin marketplace has several inherent weaknesses that make it ripe for market manipulation schemes.**

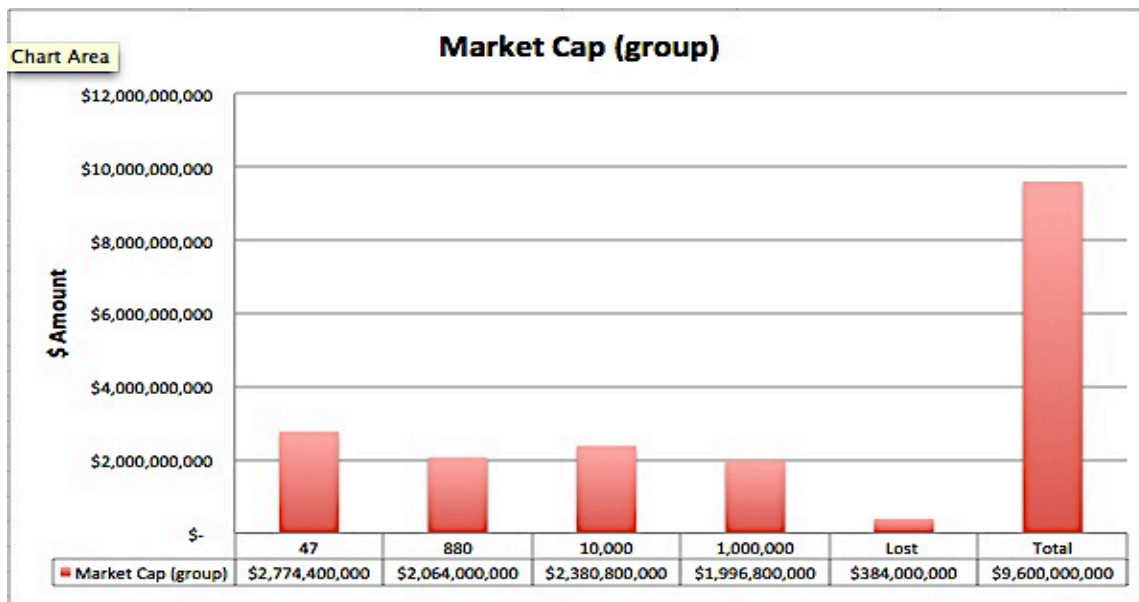
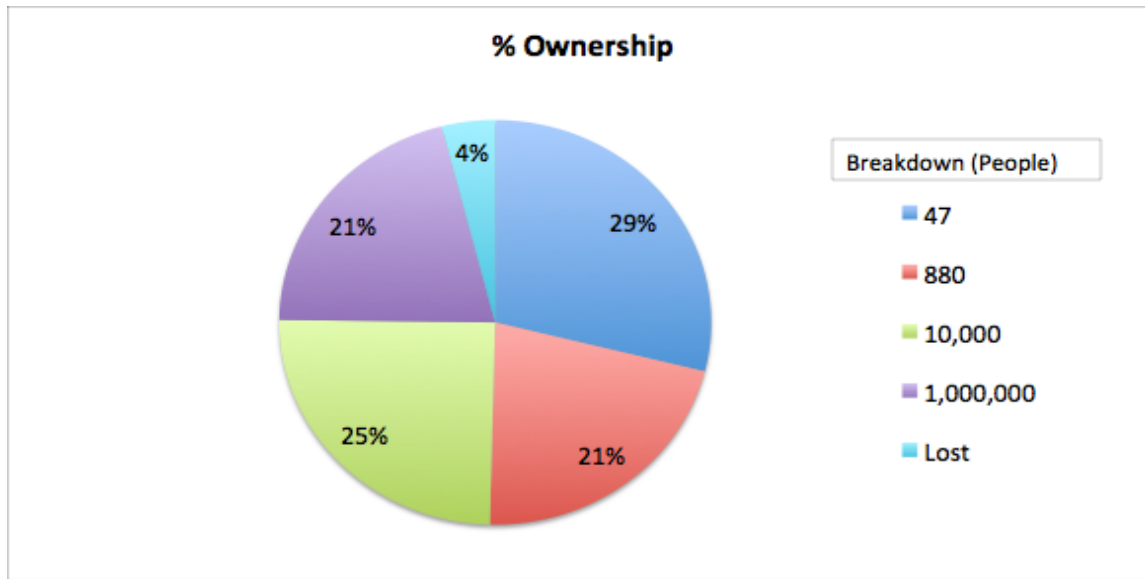
1. Pyramid Ownership Structure – Concentrated Market Power

Bitcoin ownership is concentrated in the hands of a small group of individuals providing them with an immense amount of market power. As of December 2013, 47 individuals controlled 29 percent of outstanding coins, each owning an average of about \$60 million worth of Bitcoins. Collectively, 930 individuals controlled 50 percent of e-coins, each owning an average of about \$2 million-worth of Bitcoins. This oligopoly of investors has much greater influence over price than the rest of investors. This is particularly the case as e-coin miners and early buyers (2009-2012) represent the majority of holders. More broadly, fewer than 11,000 individuals controlled 75 percent of coins while the remaining 1 million investors (many of them late comers) controlled only a sliver (20.8%) of coins. This pyramid structure allows a tiny number of miners/owners to influence how many coins are hoarded and how many new ones are made available on the market. Creating potentially artificial supply/demand imbalance would also help ensure, as long as more investors are clamoring to buy, that Bitcoin prices remain at overinflated prices. Generating an aggressive and ongoing media buzz could also ensure an adequate crop of new investors.

Breakdown (people)	% Ownership	Total bitcoins	Bitcoins owned(group)	Bitcoins owned (individual)	Market Cap (indiv)	Market Cap (group)
47	28.90%	12,000,000	3,468,000	73,787.23	\$ 59,029,787.23	\$ 2,774,400,000
880	21.50%	12,000,000	2,580,000	2,931.82	\$ 2,345,454.55	\$ 2,064,000,000
10,000	24.80%	12,000,000	2,976,000	297.60	\$ 238,080.00	\$ 2,380,800,000
1,000,000	20.80%	12,000,000	2,496,000	2.50	\$ 1,996.80	\$ 1,996,800,000
Lost	4.00%	12,000,000	480,000	N/A	N/A	\$ 384,000,000
Total	100.00%		12,000,000			\$ 9,600,000,000
Value of Bitcoin	\$ 800					

Source: <http://www.businessinsider.com/927-people-own-half-of-the-bitcoins-2013->

12#i
 xzz2
 p]Lm
 4Mg
 Q



2. Hoarding Sets an Artificially Inflated Price Floor

Hoarding is expected when an investor anticipates that the value of the asset held will be worth more in the future than what it is today. Investor hoarding is not uncommon for commodities that are in temporary or permanent low supply and are in high demand. The act of hoarding, if an investor controls enough of an asset, can also move prices higher. In 1979, the Hunt Brothers

attempted to corner the market in silver¹⁴. Unlike in the silver market, no single Bitcoin investor has been able to amass control to the level of the Hunt Brothers.

Theoretical Example – Supply-side Manipulation

If I own 100 cokes at \$1 each and I have 100 thirsty customers, the market price will remain at \$1. However, if I hoard 90 cokes and only allow 10 for sale, the price will be artificially increased as long as 100 thirsty customers remain.

Given the tiny ownership structure of Bitcoin, it is highly probable that this group collectively has used extreme hoarding (intentionally or unintentionally) as a means to set an artificially inflated price floor. Miners of e-coins and holders can help influence the amount of (newly mined and existing) coins that are available for sale. Daily trading volumes on the largest crypto-currency exchanges are only a small percentage (less than 5 percent) of overall Bitcoins minted. As a growing number of buyers enter the market (fueled by marketing hype), this marginal quantity of e-coins for sale, could help set an artificial price floor.

3. E-currency Trading Exchanges - Lack of Openness, Regulation or Oversight

The buying and selling of Bitcoin is controlled by a handful of exchanges in places like China, Japan, Slovenia, and Bulgaria. Trading is done primarily at unregulated exchanges such as BTC China, Mt.Gox, Bitstamp¹⁵ and BTCe. These exchanges handle the bulk of e-currency trading and provide important market pricing signals. More recently, Coinbase¹⁶, a privately held U.S. based startup, has begun facilitating Bitcoin transactions. At these exchanges, it is also not uncommon for certain well-connected buyers and sellers to gain preferential treatment in terms of price execution. Front running is not uncommon. In this “wild-west” atmosphere some exchanges have failed. In November 2013, GBL, based in Hong Kong, closed its doors, costing investors over \$4 million. European Banking Authority has also warned of the dangers of others failing and the lack of investor protection laws.

¹⁴ At the peak in 1979, the Hunt brothers controlled about one-third of the world’s estimated silver supply. Initially prices climbed 8 times higher once the hoarding strategy was executed.

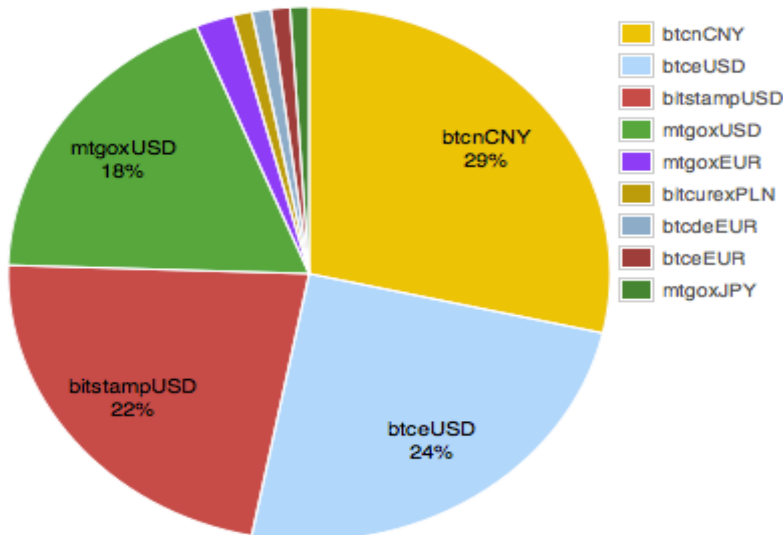
¹⁵ Bitstamp is located in London but its bank that transfers currency is located in Slovenia.

¹⁶ This thinly capitalized startup also plays a market risk mitigation role by taking on Bitcoin price risk and fixing the hard currency rate received by retailers.

Pie chart link: <http://bitcoincharts.co>

Exchange volume distribution

by market



m/charts/volumepie/

In direct conflict with Bitcoin philosophy of open source code, e-exchanges do not practice transparency or level of openness that is standard at other commodity exchanges. As a general rule, fine-grain trading information is not offered, making full price discovery difficult. Although static end-of-day closing price is available, important historical intraday trading statistics including volume, bid/ask spread and price are intentionally withheld from the market.

On several occasions, attempts have been made to obtain such data but these requests have been rebuffed. Without having to disclose such trading data, manipulators have a greater chance to thrive.

4. Market Price Quotes – Suspiciously Large Pricing Differential at Exchanges Remain

At any given time it is not uncommon for the market quote between e-currency exchanges to vary by 10 percent or more. At current pricing, the trading differential on one exchange (e.g., Mt Gox compared to BTC e) can be \$85 to \$100 or more. Trading fees and currency conversion costs (US dollars/Yen/Euro to Bitcoin), explains only a small portion of this suspiciously large pricing differential.

Lack of transparency, withholding of important intraday trading data, and no regulatory oversight has opened the door for the potential of various market manipulation schemes at the e-currency trading exchanges.

5. High Potential for False and Misleading Trades

The concentrated ownership structure, lack of regulation or independent controls around e-currency exchanges, increases the opportunity for e-coin holders and exchanges to participate in market manipulation schemes that inflate trade volume, trade price or both.

Given the large ownership concentration and the small amount of minted e-coins that are released to the market, even tiny trades, e.g., 5 coins, on the margin, can have an influence on overall price. Trades that are completed at above market prices or down to given the appearance of greater traded volume can distort market prices. Especially if the market is thinly traded and other investors are not aware of the manipulation.

Theoretical Example – Paint the Tape

If I own 100 e-coins, and if I sell 1 e-coin at an above market price to a willing accomplice, that would increase the overall economic benefit for both participants. In this scheme both seller and buy benefit. The seller gets an inflated value for all 100 e-coins and the buyer, paying above market, loses on 1 e-coin but gains on the 99 others held.

Moreover, if an aggressive Bitcoin promotion campaign is deployed to entice new buyers to enter the market, such practices would generate significant buying traffic and financial gain for those 47 individuals that own 29 percent of all e-coins. As well as to the 930 others that own 50 percent or \$5 billion of outstanding e-coins. Other non-academic research has been completed in this area supporting the theory of price fixing.¹⁷

Based on the high potential for price fixing, the major e-exchanges should be required to demonstrate that such anti-market behavior is not occurring and adequate prevention controls are firmly in place.

VIII. Bitcoin Marketing Blitz

It is a given that investors that have better information make better and more informed investment decisions. The ongoing Bitcoin marketing blitz is well orchestrated. The number of websites and blogs promoting e-currency, disseminating misinformation and in recruiting new investors has grown significantly. Much focus is placed on positioning Bitcoin as the “New, New Thing,” a disruptive technology that will change the world and allow participants to get-rich quick. The trumpeting of stories about newly minted Bitcoin millionaires is commonplace. Presently, much of investor information also fails to disclose the many inherent risks associated with virtual currency /commodity investing. Some Bitcoin investors mistakenly think an e-coin investment is the equivalent of owning stock in a startup.

As virtual currency prices have inflated, the amount of internet-buzz promoting Bitcoin ownership has proliferated. New investors have been influenced by a barrage of web-driven marketing hype and by online message board postings. Some of which, it appears, have been used in an attempt to

¹⁷ Falkvinge & Co., Bitcoin’s Vast Overvaluation appears caused by pricing fixing September 13, 2013.

pump-up prices. Much of this propaganda appears to be linked to some of the largest Bitcoin owners, e-currency exchanges, self-interested venture capital firms and other e-coin dependent businesses. In the stock market it would be the equivalent of the largest investors banding together and aggressively talking-up their book through multiple media channels. However, in the financial markets, there is a combination of transparent financial reporting, regulation, diligent shareholders, stock analysts and financial journalists all acting as important counterbalances. Presently, these market information safeguards and quality controls are lacking. Recently, one of the Winklevoss twins of Facebook fame, who with his brother own an estimated 1 percent of all outstanding Bitcoins or \$100 million, prognosticated that Bitcoin would catapult to \$40,000. Remarkably, this super-bullish prediction was made when Bitcoin traded at \$1,000, yet no creditable rationale was given why this fortyfold increase would happen. Such talking-up-your-book marketing can be particularly dangerous for unsophisticated investors, especially when market information is more one-sided.

More recently, the venture capital community has provided funding upward of \$50 million for Bitcoin related companies, growing the involvement of business-savvy groups.¹⁸ As the attempt to commercialize Bitcoin accelerates and the financial stakes get higher, there will be a greater focus on lobbying and industry self-promotion. Organizations such as Bitcoin Foundation, Bitcoin.org, Reddit.com, Coindesk.com, help.org and weusecoins.com remain primarily focused on gaining industry converts. Few Bitcoin websites presently provide investors with detailed, risk-focused and balanced information. **In such an environment, it is understandable how a hyper-asset bubble could have mushroomed so rapidly and why it has been more challenging for investors to make prudent investment decisions.**

In conclusion, I hope this testimony will provide additional insight and spur further research and analysis into virtual currencies and the growing risks they pose to U.S. investors, the financial system and to the overall global economy if not properly managed.

¹⁸ Coinbase receiving the lion's share of this early round of venture capital funding.