

Can Bitcoin change from a bubble economy into a growth economy?

By Tim Swanson

I recently wrote an [article](#) that received a lot of interesting feedback.

One executive, “Alice,” at a Bitcoin startup said,

Regarding your overall point about Bitcoiners boxing ourselves into a corner, do you ever foresee a situation where (motivated by long-term self-interest), some of the original holders of large amounts of bitcoin actually conspire to give away a good chunk of their holdings so that more people on Earth are actually in possession of the coin?

Short answer, no.

While there may be some edge cases (like Roger Ver [donating](#) to FEE last year), I do not expect more than a small minority to effectively give away their coins voluntarily. Why should they? If Bob has bitcoins – because of a number of factors detailed below – Bob is incentivized to “hodl” (sic) to the moon. This phenomenon is not something new, it frequently happens historically in asset bubbles.

Up front, it is likely premature to call all proof-of-work-based cryptocurrencies unsustainable or bubbles. However, the non-linear variety, the asymptote-based money supply version used in Bitcoin, Litecoin, Dogecoin and several hundred others has created a “get rich quick” distribution model (because that is how the trust fund's principal is divvied out, it tapers off over time). In a sense, the internal incentive mechanics (the scheduled inflation) creates froth and irrational exuberance by design.

John Kenneth Galbraith has written several books on this topic, most notably [The Great Crash, 1929](#) and [A Short History of Financial Euphoria](#). The latter version has several germane excerpts that relate to just about any historical financial bubble.

One notable, relevant passage was reused in [The Essential Galbraith \(pdf\)](#) and has Galbraith describe (contrarian) analysts who predicted bubbles and were called a number of names for trying to identify risks and bring challenges to the forefront. Below is a portion of the six page passage originally from Chapter 1:

Strongly reinforcing the vested interest in euphoria is the condemnation that the reputable public and financial opinion directs at those who express doubt or dissent. It is said that they are unable, because of defective imagination or other mental inadequacy, to grasp the new and rewarding circumstances that sustain and secure the increase in values. Or their motivation is deeply suspect. In the winter of 1929, Paul M. Warburg, the most respected banker of his time and one of the founding parents of the Federal Reserve System, spoke critically of the then-current orgy of the “unrestrained speculation” and said that if it continued, there would ultimately be a disastrous collapse, and the country would face a serious depression. The reaction to his statement was bitter, even vicious. He was held to be obsolete in his views; he was “sandbagging American prosperity”; quite possibly, he was himself short in the market.

Is all criticism of Bitcoin or its progeny merely a new form sandbagging? No, Carol could like the technology Alice uses yet could still equally be critical of the missionary mentality surrounding the marketing of the technology. Galbraith's *A Short History of Financial Euphoria*, goes through a handful of well-known bubbles which can be instructive to both novice and veteran's within the digital currency space alike.

Some common themes and parallels he found throughout each episode are (in reverse pagination):

- "The recurrent and sadly erroneous belief that effortless enrichment is an entitlement associated with what is thought to be exceptional financial perspicacity and wisdom is not something that yields to legislative remedy." (p.101)
- On Bernard Cornfeld's activity with Investors Overseas Services and perhaps some Bitcoin adopters, "It is difficult to believe that he was guilty of anything beyond his own misguided energy and ambition. The guilt lies, as always, with those who sought so eagerly and by such a transparent device to be so separated from their money." (p.93)
- Regarding financiers America and other industrialized countries of the time, "Reflecting the accompanying optimism, youthful market operators, notably the Go Go boys of the 1960s, were believed by others and, as ever, by themselves to have a new and highly innovative approach to investment opportunities." (p. 90)
- Regarding manias, "Individuals and institutions are captured by the wondrous satisfaction from accruing wealth. The associated illusion of insight is protected, in turn, by the oft-noted public impression that intelligence, one's own and that of others, marches in close step with the possession of money. Out of that belief, thus instilled, then comes action – the bidding up of values, whether in land, securities, or, as recently, art. The upward movement confirms the commitment to personal and group wisdom. And so on to the moment of mass disillusion and the crash. This last, it will now be sufficiently evident, never comes gently. It has always accompanied by a desperate and largely unsuccessful effort to get out." (p. 106)
- Regarding the crash of 1929, "How little, it will perhaps be agreed, was either original or otherwise remarkable about his history. Prices driven up by the expectation that they would go up, the expectation realized by the resulting purchases. Then the inevitable reversal of the expectations because of some seemingly damaging event or development or perhaps merely because the supply of intellectually vulnerable buyers is exhausted. Whatever the reason (and it is unimportant), the absolute certainty, as earlier observed, is that this world ends not with a whimper but a bang." (p. 83)



The remaining quotes can be found in Appendix I after the conclusion of the article below.

Again, this is not to say that bitcoin (the token) is a bubble itself, we can only know for certain later on. But, a lot of the promotion, marketing and overall zeitgeist around it is very similar to traditional financial bubbles including the usage of the same phrases "this time things are different" or "we have reached a permanent high plateau" or "don't you want to be rich?" or "you don't have to do anything, just sit back and relax" or "no way you will lose" or "you simply do not understand its ability to

disintermediate” or “it’s a new financial innovation that the world has never seen.” Yet, the world has seen new commodities before (DRAM). The world has seen new currencies before (euros), it has even seen the likes of [pre-Bitcoin cryptocurrencies](#) such as [Beenz](#) (which raised \$100 million as a “web currency”). Alice cannot sit back and relax indefinitely, someone has to work. Plateaus do not last forever. Speculation is a zero-sum game and affluence can be ephemeral. Lastly, being your own bank is a Pyrrhic task; you can do it but have a high chance of failing ([pdf](#)). Perhaps the protocol is the real deal for certain use-cases, but the tokens are probably not the panacea that many proponents make it out to be. Furthermore, one area for future research is to look for whether or not a specific user base or pool of potential speculators has been exhausted (e.g., beyond redditor saturation).

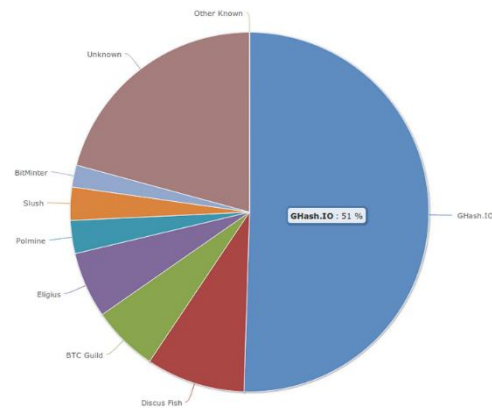
A non-spending economy

Gambling is a zero-sum game, there has to be a winner for every loser; and compounding the issue is that the house tilts the odds in its favor – that is one reason it is called a “math tax.” Similarly, speculation in securities is zero-sum and in some cases a negative-sum game. In his most recent book, [Flash Boys](#), Michael Lewis has described the *reductio ad absurdum* of this in action: high frequency trading (HFT). There is nothing inherently malignant with HFT in fact, liquidity may increase; yet no additional utility is created purely by day trading securities (this is also due in part to exchange commissions).

One common refrain by a vocal segment of the Bitcoin community is that “investing” in alts is a zero-sum game, that no new wealth is being created since that money does not go to improving the “company” (network) itself – for every winner there has to be a loser. Yet there is a similar issue with bitcoin in that while speculation has drawn in new crowds which often create new demand, those funds are not being lent out as they would in a normal modern economy. That is to say, there are few ways to save bitcoin and lend them out (Bitreserve, BTCJam and Bitfinex are notable examples), you can only hoard them. Because of this known characteristic, some advocates claim that such hoarding actually creates reserve demand for the token. That could be the case if it was a currency or even a real share of equity, but it is not (it is probably a [money-like information commodity](#)). Holding a bitcoin is not like holding equity in Bitcoin. Bitcoin (the network) is not a company. With a publicly traded company like Google, shareholders receive a portion of equity (or rather a securitized future stream of revenue) in exchange for providing Google capital today. Google can then reinvest that into operational activity such as funding internal projects to create more utility (through research and development, training, etc.). The way Bitcoin is set up today, that is not possible. For instance, mining pools technically have a built-in incentive to finance developers, but in practice – with the exception of Eligius (and Luke-Jr.), do not.

Living in a trusted, post-51% world

In fact, while its hashrate has increased by many orders of magnitude, the Bitcoin network is qualitatively less secure today than it was two years ago. This is in large part due to the centralizing of the mining process within ASIC and ASIC farms (due to economies of scale). For example, the most recent episode of the ongoing series of bad cop/good cop [involving](#) the largest pool, Ghash.io should put to rest the belief that only state actors can brute force the network. While some measurements [differ](#), late on June 12, 2014, GHash.io reached approximately 51% for a 12-hour time span (note: Coinotron [was over](#) 50%+ with Litecoin for several days last month). And at roughly \$2 / gigahash it would cost roughly \$90 million to obtain 51% of the network hashrate (not necessarily conduct an attack) – which is significantly lower than military budgets or other Hollywoodesque scenarios and conditions that some advocates claim could only happen under. Greg Maxwell, a Bitcoin core developer, even has a probability of success [calculator](#) that illustrates the problems with having more than 40%.



Peter Todd, another Bitcoin core developer, recently discussed this in an interview (as an aside, Todd also announced after the above Ghash.io episode that he thinks the economic incentives behind Bitcoin [may be flawed](#); see also [Bitcoin Hurdles](#)):

[Embed: <https://www.youtube.com/watch?v=zaBmZ98q7c0>]

What this means is that the network went from trustless, to trusted. The community has to trust (through vigilance) that pools like Ghash.io will not double-spend, censor transactions or conduct a [Finney attack](#) (attacking a 0-confirmation spend). It is doubtful that Ghash.io would do so, but it can (the economics of cloud hashing may be currently skewed towards cleaning stolen coins, hence the [pay-for-faucet](#)). And even if Ghash.io somehow broke apart, someone else will fill the void. This is because mining is essentially a statistical [Poisson process](#) (technically a [NHPP](#)), there is too much variance to be left to small pools and thus eventually [someone](#) else will eventually capitalize off the economies of scale.

In addition, in a recent exchange I had with Dave Hudson a network expert and statistician at [HashingIt](#), according to him:

There are a lot of incentives for centralized mining. One of my favourite stats at the moment is [Bitcoin Stats Data Propagation](#). It is taking > 3 seconds for a block to propagate to 50% of the network and > 10 seconds to hit 90%. That is a lot of time where miners are potentially working on the wrong problem! With better data I want to calculate those stats properly because this has a couple of effects:

- 1) Distant miners end up disadvantaged because they're essentially doing incrementally useless work for the first few seconds after a block is found.
- 2) Centralized pool schemes can disseminate blocks much faster - in fact they could prioritize disseminating new work over announcing the new block or have the systems

in place to enable those blocks to be broadcast by dedicated systems that aren't involved in mining activities.

Concluding, Hudson notes the irony in which, “What's been somewhat amusing me all day is to see everyone arguing about GHash.IO not acting ethically within a system that is intrinsically designed with an assumption that no parties are trustworthy.” Consequently, readers may be interested in a forthcoming paper from Jonathan Levin, *Creating a decentralised payment network: A study of Bitcoin*, which discusses this issue in more detail.

On the mining side, aside from chronic scammers, there are essentially only three consistently profitable entities:

- TSMC
- Utility companies
- Large mining farms with access to the newest ASIC batches reducing overall operating costs relative to marginal players

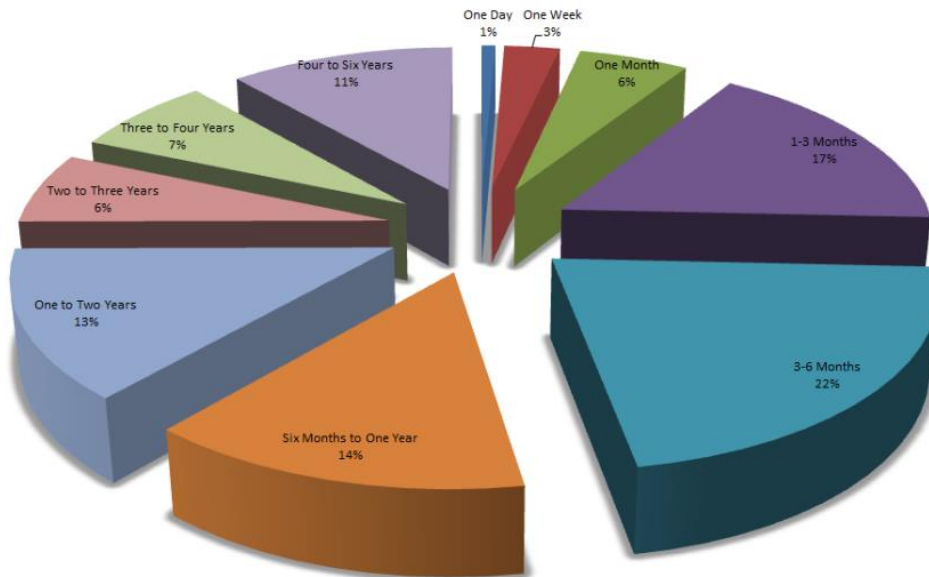
Perversely, the roughly \$1 billion worth of capital spent on mining the past 12 months primarily went towards electrical companies and hardware manufacturers, not into the ecosystem itself ([pdf](#)).

As Bitcoin core developers have pointed out on numerous occasions: the idea that miners and mining pools (the labor force) would abandon pools like Ghash.io is continually disproven (and more than likely CEX.io, the parent company of Ghash.io simply moves hashrate over to “unknown pools” until calm has been restored). Instead, miners, understandably pay attention solely to the hashrate arms race. And their motivation to do so is prudent: they are economically rational actors (*homo economicus*) because the seigniorage subsidy accounts for roughly [99.7%](#) of the laborers income (seigniorage minus transaction fee). Thus, as Dave Hudson adroitly pointed out above, it is puzzling why the community would be [vexed](#) that a pool would want to provide services (low variance, merge mining, multi-language support, DDoS protection, contract trading, and *purportedly* even coin mixing) in the most efficient manner within a system where trust is taboo.

Again, the more hashrate (lottery tickets) pool operators can get their labor force to throw towards obtaining the winning lottery number, the more revenue they can earn for their company whose physical capital stock is always depreciating. As a consequence, anything that is not working towards that end, is marginalized. Hence, as noted in my previous article, most mining pools and farms have not upgraded to the latest version of the Bitcoin core software because it offers no new useful features for most miners.

Going after the same size pie

**Bitcoin Value Distribution Based on Age of Last Use Since
May 16, 2014**

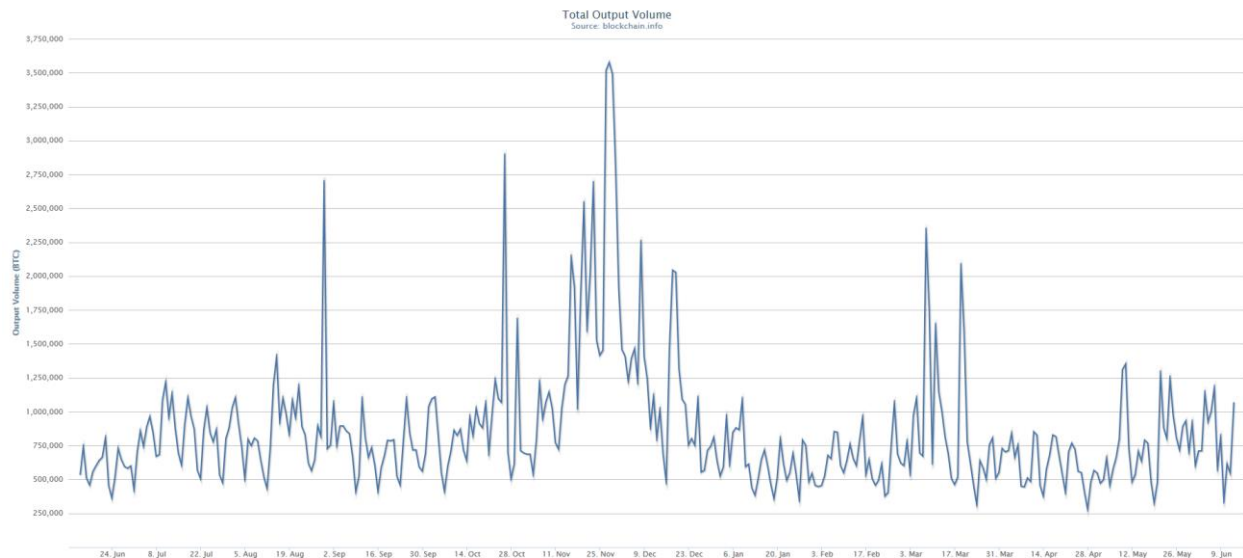


The above chart was [created](#) by John Ratcliff a principal engineer at Nvidia. What this illustrates is the last time the private key corresponding to bitcoins (UTXOs) were active. Or rather, the amount of bitcoins based on their last use.

What some adopters fail to realize is that there is only a small amount of "liquid" bitcoins, roughly 10-15% based on Ratcliff's numbers. And of that number a significant number are either sitting on an exchange or being traded on an exchange. Ignoring the bitcoins that are used for grey market activity (porn, gambling), mixing, mining rewards or for research, there is a maximum upperbound amount of bitcoins that are in circulation for actual commerce.

Basically the issue Alice was confronting at the beginning of this article is that she and all other merchant processors are effectively having to compete for the same small liquid tokens, roughly 1.5 million bitcoins at most and more likely no more than 500,000 bitcoins. That pie is not getting any larger; bitcoins are not being added to the long-term liquidity pool because again, most bitcoin holders are speculating – they have an incentive to hold and several disincentives to spend.

And incidentally, there is a chart that tries to show what this could be called the [Total Output Volume](#) (remember bitcoins are actually unspent transaction outputs); the total value of all transaction outputs per day:



This includes coins which were returned to the sender as “[change](#)” and thus the likely number is substantially less (perhaps by an entire order of magnitude). The occasional variance above typically correlates with momentary price spikes such as the run up in December.

Thus in effect, all merchant processors are fighting after the same small portion of the pie. A pie that is not growing because it is inelastic. Or in more colorful terms: Bitcoin does not really have a consumer economy, it has a speculative futures market attached to an emerging, capital starved country. And instead of creating utility for the actual country, most bitcoin holders instead have an incentive to buy and hold. It is a classic type of prisoner’s dilemma – everyone would be better off if all participants cooperated, but there are numerous incentives not to (see [Bitcoin as a public good](#)). In fact, they are encouraged not to by endless threads on community sites and social media. Hence, in this case, Bitcoin is still largely a zero-sum and even negative sum economy that is probably only growing on the edges in trusted-silos (where economies of scale are larger and more efficient per unit of capital).

Again, while speculative this could be one of the reasons why BitPay recently had a leadership change and has hired specific people over the past few weeks. Despite the roughly \$1 million in daily payments they are [processing](#), they have no real way to extract value due to their thin margins (Coinbase and others may be in the same [situation](#); few people spend in part because there are few liquid bitcoins).

Why?

Bitcoin is a brutally one-sided against spenders. Not only is the foreign exchange volatility an issue that normal consumers prefer not to have to deal with (e.g., why does Alice want to be exposed to foreign currency movements?), but they have to pay a fee if they want their transaction put into the next available block. For instance, following the [announcement](#) by the US Marshals Service that it would begin selling seized coins from Silk Road, on June 12, 2014 the price level of bitcoin dropped by 9% in a matter of 6 hours and then regained half of that amount six hours later. In finance terms, it has a high beta (β). And while helpful, it is unlikely that any amount of temporary [discounts](#) will on-ramp merchants who would prefer not to have to juggle through known processing steps.

Even if the merchant base that accepted bitcoin tripled again tomorrow it would not change the number of possible tokens that can be used in commercial transactions. This is a bug in a modern economy, it is the side effect of having an inelastic money supply. And it is unclear how this will change going forward as volatility upward just incentivizes people to hold onto it longer for the dream of becoming Bitcoin Rich.

Demythification

There are a few other areas that tie into what Galbraith noted above; for instance, despite the contention that early Bitcoin adopters took risks, they actually did not take *large* risks. While this is a topic that could and will fill additional articles, securing the bitcoin network with your hashrate in the first two years was virtually risk-free as capital and operating costs were both minimal (this is not to say it is or was a risk-free asset under CAPM). The biggest risk was accidentally destroying the hard drives (not backing up the wallet.dat) or sending them to hosted wallets like MyBitcoin ([slides](#)).



While there are indeed greater risks to capital outlays for large mining farms today (e.g., amortization cost curves), one of the reasons for the continual popularity for creating alts is that it is not very risky to be a first mover when all you have to do is fork open source code and promote it on a forum. This is not to say that early adopters do not deserve the tokens they have but it would be false to claim they had any specific unique ability that has not occurred in other bubbles as quoted above. And at the same time, some aspiring fund managers are suggesting bitcoin's performance seems to have a high Sharpe ratio; going forward, financial researchers may be interested in looking at whether kurtosis or skewness (such as coin distribution) impacts it as well.

As a friend recently pointed out, this is not an appropriate measure when return distributions are asymmetrical or for something that is treated as a collectible. For example, if the distribution is negatively skewed, you might calculate a Sharpe ratio for a period when there were a large number of small gains. This would not correctly reflect the small probability of occasional large losses (e.g., writing call/put options, an activity that has been likened to "picking up pennies in front of a steamroller"). Again, in practice it trades more like a commodity than something with P/E ratios (it has no earnings). And the vast majority of bitcoin price data is likely explainable via an exponential growth curve. In fact, 90.1% of the historical price variability is accounted for [by the equation](#): $y = 10^{(-36 + 0.0029*x)}$, where y is the price and x is the fractional year. However, despite knowing this, there is a tendency of people to favor information that confirms their beliefs and this is how many participants get trapped in the bubble.

In terms of replacing fiat with bitcoins, what a small element of advocates are effectively saying when they claim total global fiat value will be mapped onto bitcoins is that these adopters will control 12/21st of the world's fiat-based wealth (e.g., 12.8 million bitcoins out of the 21 million). There is no reason to believe this is the case, for the same reason that other commodities are somehow mapped to the total global fiat value. Nor is this stated to defend existing institutions and their policies, there is simply a difference between what can happen and what will happen. Bitcoin could theoretically become the sole reserve currency of a major country, but it will not be due to how [reserve currencies actually operate](#).

Another common refrain by some Bitcoin advocates is that the open source network is similar to the origin and evolution of Linux. Yet apart from a few superficial attributes (open codebase written in C++ and developer disagreements), the similarities end. For instance, did the last wave of enthusiastic volunteers in the technology space generate as much revenue as the early adopters of bitcoin merely by releasing code and leaving their laptop on? No. Someone had to create value and utility which was later incorporated and funded by real businesses with real needs to customers with real needs. Similarly, someone is going to have to roll up their sleeves and do the same for this space.

Conclusion

Virtually every technical challenge that Bitcoin has in this article involve something related to its code base, all of which can be [arbitrarily changed](#). Yet in practice this cannot happen because of how miners, the labor force – will only cycle profitable code. That makes sense, they have bills to pay and they are the labor providing security and transactional throughput. As [noted](#) previously, this is a form of regulatory capture which frequently occurs and stymies developing countries. Similarly, the inelastic money supply could be changed into a type of “[growthcoin](#)” or “[stablecoin](#)” yet it would fork the community, dividing them into one group who wants to spend coins and another who wants to hold.

This then dovetails into a question a friend recently asked me, “Will every failure of a bitcoin business be blamed on incompetent operations rather than the underlying structural problems?” If the answer is yes, then not much has changed since the previous financial bubbles. One ongoing, tangential solution for many seems to be, to keep changing the name and denomination of units to tweak the marketing for people into buying the tokens whereupon the price is driven back up. If that eventually wears out, it could have laid the precedence for printing more under the guise of divisibility.

While these topics will continue to be debated, there are at least two more questions which need to be addressed at some time: should new denizens of this space follow adopters many of whom have not disclosed their financial attachment to bitcoin? Is skepticism not warranted for a space rife with conflict of interest, such as adopters with a vested interest in bitcoin, pushing for more adoption solely for the subsequent price bump? And while there are other challenges that will likely need to be sorted out, one that engenders this space is that most adopters are unknowingly addicted to subsidies, mining subsidies, someone else is paying for their transactions. And they do not know it. This is not sustainable yet it is institutionalized through the marketing campaigns of “free.” And only a controversial code rewrite can fix that.

In conclusion, one of the biggest problems in this space is that few people are actually looking at real data. On the one hand there is a public, independent, transparent database called a blockchain that advocates are quick to point to as a disruptive technology. Yet when it comes to looking at behavior on this blockchain, very few people or organizations have discussed what is actually happening on it. Arguably the primary technological breakthrough is the blockchain and bitcoin (the currency) is simply the first appcoin; one of many. In fact, there are at least 83 [other uses](#) for it and multisig itself opens up a new world for managing digital and digitized assets. Yet the sole metric and focus by many, seems to be price levels, which if Galbraith's works are any indication could be a sign of unsustainable bubble activity. For balance, Galbraith is likely overly negative on his account of bubbles involving new technologies. Despite the capital misallocation and hyperbole, at the end of the day sometimes there do end up being a few practical uses for some of the new technology and new human capital that the

bubble helped finance (e.g., dark fiber). Consequently, bitcoin (the currency) may be closer to the dotcom boom than to the Chinese [property market](#).

In the future, data driven firms will begin to look at blockchain activity, correlate it with a variety of edge-cased variables and will be able to advise their clients on what trends are taking place. And there are companies like Coinalytics and Coinometrics that are beginning to provide these resources and analytics to investors. The Cliff's notes version of what is happening can be found in my piece, [A Marginal Economy versus a Growth Economy](#). Incidentally, I think there will likely be a reflation of the bubble later this summer with "bitlicenses." I wonder how long until Galbraithcoin is minted – or maybe we should just wait for its fork, Galbraithmaniacoin.

Appendix I

- "Nineteen twenty-nine is also remembered because there were then evident all the elements of the euphoric episode and especially the powerful commitment to presumed financial innovation. This last included, as ever, the rediscovered wonders of leverage, presently to be examined, and the parade of publicly celebrated genius. Optimism built on optimism to drive prices up. Then came the crash and the eventual discovery of the severe mental and moral deficiencies of those once thought endowed with genius and their consignment, at best, to oblivion, but, more grimly, to public obloquy, jail, or suicide. In 1929 and for years thereafter, all this was larger than life." (p. 70-71)
- Regarding the manufacturing boom post-Civil War, "As with canals and turnpikes, it was transportation, this time with railroads, that was the focus of the speculation. Here the horizons seemed truly without limit. Who could lose on what was so obviously needed?" (p. 64)
- "As ever, the sight of some becoming so effortlessly affluent brought the rush to participate that further powered the upward thrust." (p. 49)
- Galbraith describing something reminiscent of bitcoin and many of its altcoin clones, "Nor was the South Sea Company the only opportunity. Its success spawned at least a hundred imitators and hitchhikers, all hoping to take part in the boom. These included companies to develop perpetual motion (also ahead of its time), to insure horses, to improve the art of making soap, to trade in hair, to repair and rebuild parsonage and vicarage houses, to transmute quicksilver into malleable fine metal, and to erect houses or hospitals for taking in and maintaining illegitimate children, as well as the immortal enterprise, 'for carrying on an undertaking of great advantage, but nobody to know what it is.'" (p. 49)
- "Speculation, it has been noted, comes when popular imagination settles on something seemingly new in the field of commerce or finance. The tulip, beautiful and varied in its colors, was one of the first things so to serve. To this day it remains one of the more unusual of such instruments. Nothing more improbable ever contributed so wonderfully to the mass delusion here examined." (p. 28)
- Galbraith could be discussing Mt. Gox, "The final and common feature of the speculative episode – in stock markets, real estate, art, or junk bonds – is what happens after the inevitable crash. Thus, invariably, will be a time of anger and recrimination and also of profoundly subtle introspection. The anger will fix upon the individuals who were previously most admired for their financial imagination and acuity. Some of them, having been persuaded of their own exemption from confining orthodoxy, will, as noted, have gone beyond the law, and their fall and, occasionally, their incarceration will now be viewed with righteous satisfaction." (p. 22)
- How many times have some bitcoin adopters claimed to be the new landed gentry ossifying into "old money"? Galbraith notes, "In all speculative episodes there is always an element of pride in discovering what is seemingly new and greatly rewarding in the way of financial instrument or investment opportunity. The individual or institution that does so is



thought to be wonderfully ahead of the mob. This insight is then confirmed as others rush to exploit their own, only slightly later vision. This perception of something new and exceptional rewards the ego of the participant, as it is expected also to reward his or her pocketbook. And for a while it does.” (p. 18-19)

- “That fascination derives, in turn, from the scale of the financial operations and the feeling that, with so much money involved, the mental resources behind them cannot be less. Only after the speculative collapse does the truth emerge. What was thought to be unusual acuity turns out to be only a fortuitous and unfortunate association with the assets. Over the long years of history, the results for those who have been thus misjudged (including, invariably by themselves) has been opprobrium followed by personal disgrace or a retreat into the deeper folds of obscurity. Or it has been exile, suicide, or, in modern times, at least moderately uncomfortable confinement. The rule will often be here reiterated: financial genius is before the fall.” (p. 17)
- On the reason for continually fulfilling George Santayana’s dictum about not learning from the past, “The first is the extreme brevity of the financial memory. In consequence, financial disaster is quickly forgotten. In further consequence, when the same or closely similar circumstances occur again, sometimes in only a few years, they are hailed by a new, often youthful, and always supremely self-confident generation as a brilliantly innovative discovery in the financial and larger economic world. There can be few fields of human endeavor in which history counts for so little as in the world of finance. Past experience, to the extent that it is part of memory at all, is dismissed as the primitive refuge of those who do not have the insight to appreciate the incredible wonders of the present.” (p. 13)

