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May 2020

Bitcoin's Third Halving: Investment Theses and Implications

An in-depth Report by Messari
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Bitcoin Halving 2020

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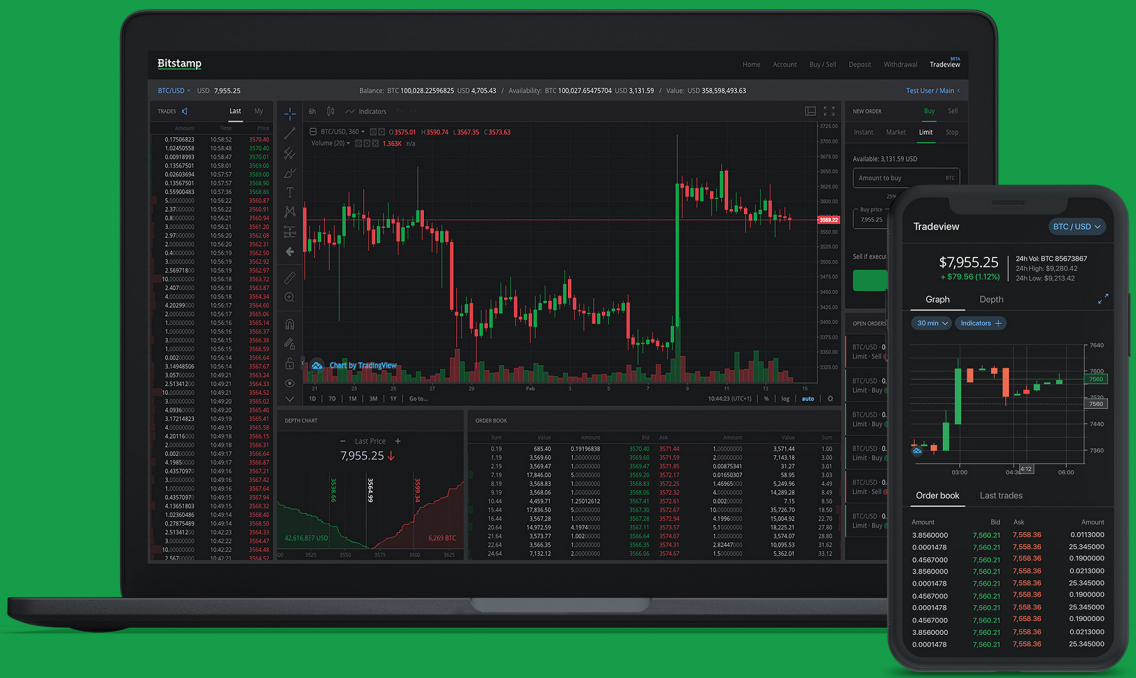

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Meet the authors

Jack Purdy – Jack is a Research Analyst at Messari. Prior to Messari Jack was a banking analyst at Capital One working in their Capital Markets and Enterprise Valuations group. While at Capital One he was an early community analyst for Messari before joining full-time. He graduated from the University of Richmond with a degree in Finance and Mathematics.

Ryan Watkins – Ryan is a Research Analyst at Messari. Prior to joining Messari, Ryan worked as an investment banking analyst at Moelis & Company where he advised on Mergers & Acquisitions, Private Placements, and Restructurings across all industries with a focus in technology, media, and telecommunications. He previously held positions at Bank of America Merrill Lynch, and CastleOak Securities. Ryan holds a Bachelor of Science from Fordham University where he studied Finance and Computer Science.

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Introduction

From the early cypherpunks who rallied around the message forever ingrained in Bitcoin's genesis block to the modern-day Bitcoiners seeking to opt-out of a fiat system gone mad, there has been one characteristic of Bitcoin that captures the attention of anyone curious enough to peer down the rabbit hole - Bitcoin's fixed supply and decreasing issuance schedule.

Embedded deep within both the code and social contract[1] of Bitcoin, its supply schedule stands in direct opposition to the inflationary monetary systems we see today. Loose monetary policies have become normalized to the point that most people aren't phased by the latest trillion dollar injections into the economy. However, a growing number of people are beginning to question this regime, leading them towards a system where this type of debasement is impossible. As Vitalik Buterin, writing for Bitcoin Magazine, once put it:

"One of the major faults of traditional, "fiat", currencies controlled by central banks is that the banks can print as much of the currency as they want, and if they print too much, the laws of supply and demand ensure that the value of the currency starts dropping quickly.

Bitcoin, on the other hand, is intended to simulate a commodity, like gold. There is only a limited amount of gold in the world, and with every gram of gold that is mined, the gold that still remains becomes harder and harder to extract. As a result of this limited supply, gold has maintained its value as an international medium of exchange and store of value for over six thousand years, and the hope is that Bitcoin will do the same" [2]

In order to reproduce the natural scarcity of an asset like gold, Bitcoin employs a predefined issuance schedule, periodically reducing the amount of coins issued to ensure they become harder to "extract" over time. This change in new supply has become known as the halving.

In this report, we will explain what the halving is along with related key concepts. For those already intimately familiar with the halving, feel free to skim over that section to the next where we then take it a step further to explore the implications that the halving could have on the health of the Bitcoin network and the price of its native asset, BTC. After that, we outline the bull and bear cases along with popular frameworks and models used to promote them. Finally, we provide our opinions on the actual merit of some of these models and compare that to differing opinions from the Messari team.

[1] Hasu, "Unpacking Bitcoin's Social Contract" Medium, Dec. 3, 2018.
[2] Vitalik Buterin, "Block Reward Halving: A Guide" Bitcoin Magazine, Nov. 27, 2012.

Part 1: What is the halving?

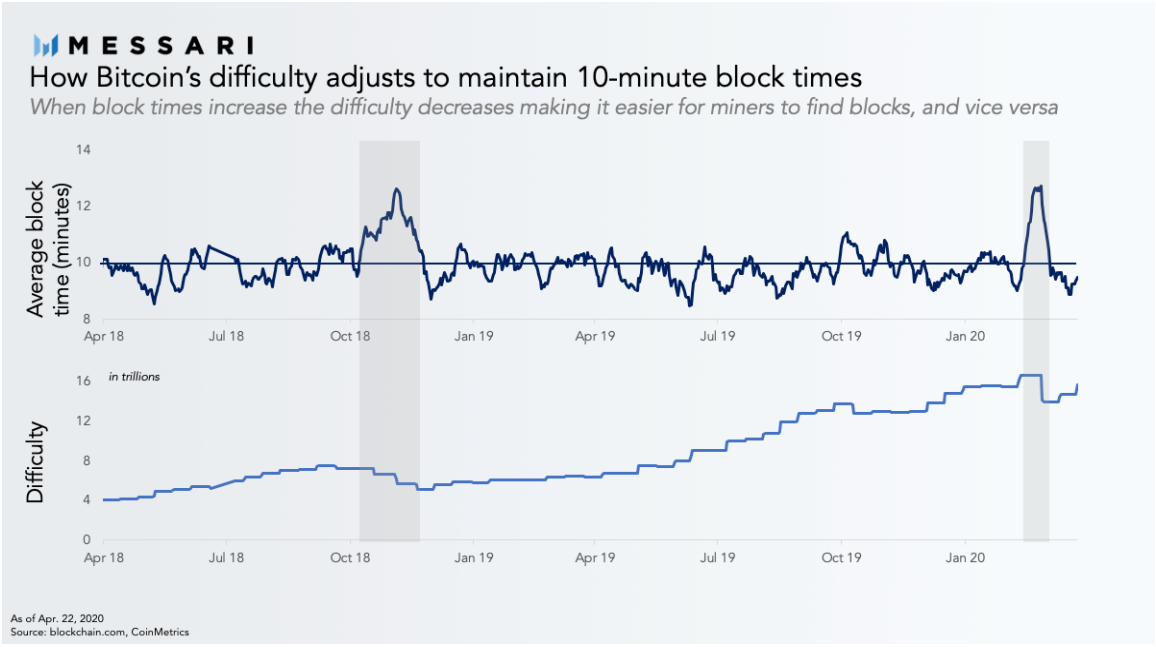
How and why Bitcoin reduces block rewards every four years

Block times and difficulty adjustments

Every 210,000 blocks the amount of newly issued bitcoin is cut in half. Typically this "halving" will come every four years, but the exact dates are hard to predict due to variability in the rate at which new blocks are added.

On average, a new block is added to the Bitcoin blockchain every 10 minutes through a process known as mining. Mining involves specialized computers that perform computationally expensive work in order to validate transactions. This work amounts to finding a needle in a haystack where the needle is a random number (nonce) that satisfies a given condition. The total amount of work being done is referred to as the hash power of the network.

As more hardware comes online, hash power increases and nonces are found faster. In order to retain the targeted 10 minute block time, the protocol has a difficulty adjustment to make it harder to find the nonce. This occurs every 2,016 blocks (approximately every two weeks), however, the actual time depends on how hash power changes over that period.

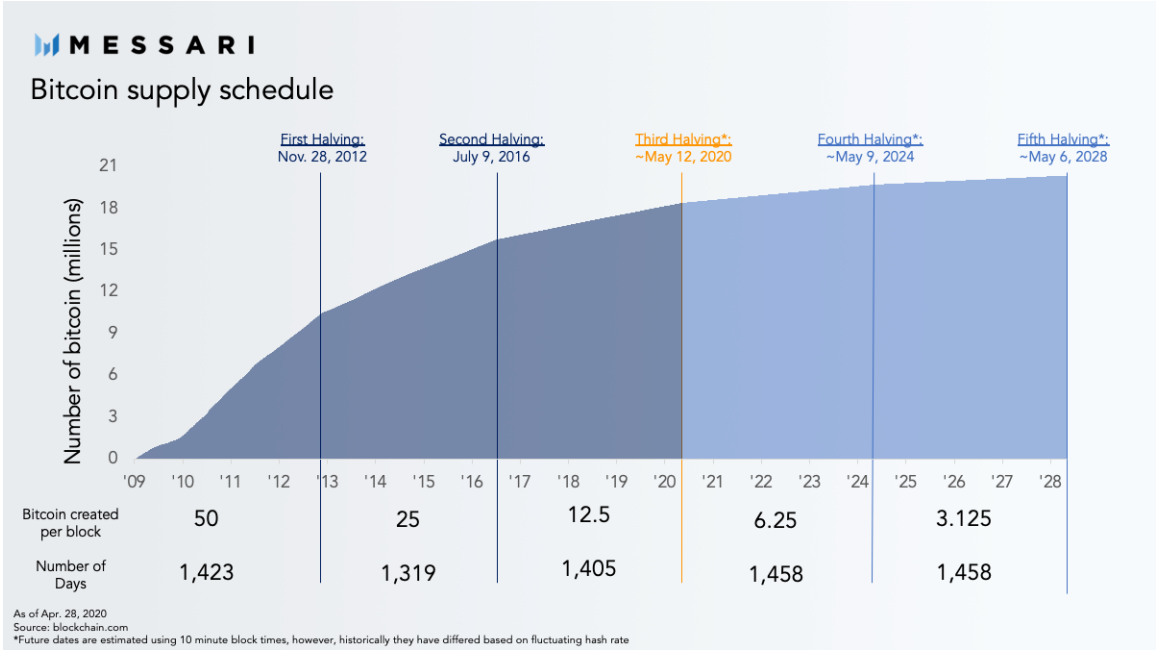


For the majority of Bitcoin's existence, the hash rate has been increasing, meaning block times have averaged less than 10 minutes. This is why previous halvings occurred more quickly than the expected four-year time interval.

New issuance and incentives

When miners successfully mine a block they are rewarded in both newly minted bitcoin and the previous block's transaction fees as compensation for that work. It is this block reward that enables the network to function properly as miners are rational, profit-seeking actors who require an incentive to perform this crucial task. This is the "magic" behind Bitcoin that enabled it to solve the decades-old Byzantine Generals Problem[3] of achieving consensus among a distributed set of actors who don't trust each other. Put simply, miners provide security to the Bitcoin network by contributing hash power.

In the early days of Bitcoin it was important to distribute coins to users and incentivize miners to contribute hardware and electricity to secure a nascent technology. Early block rewards were designed to start high in order to accomplish this. Under the assumption that over time the price of bitcoin would increase, and miners could receive less bitcoin while still profiting, an issuance reduction was hardcoded into the protocol to reinforce scarcity over time.



Since Bitcoin's launch, the block reward has halved twice. The first halving occurred in November 2012 when it was reduced from 50 BTC to 25 BTC and the second occurred in July 2016 when it was further reduced to 12.5 BTC. On May 12, 2020 when Bitcoin reaches its 630,000th block, the block reward will be cut in half for the third time, falling from 12.5 BTC to 6.25 BTC.

[3] Leslie Lamport, "The Byzantine Generals Problem" ACM Transactions on Programming Languages and Systems, Vol. 4, No. 3, July, 1982

Part 2: Implications of the halving

How the halving impacts the Bitcoin ecosystem

Miner economics

The Bitcoin halving is a multifaceted event that will affect all stakeholders in Bitcoin's ecosystem but it's miners who will be the most impacted. Holding price constant, Bitcoin miners face a 50% overnight drop in revenue, as their BTC earned every block is cut in half.

While this overnight drop may not be a shock, given that the halving is known in advance, it doesn't mean that planning for the halving is straightforward. The amount of new BTC issued every block is only one side of the equation. The other side is bitcoin's price.

Without a 100% price increase to counteract the reduction in new issuance, every miner's revenue will be impacted significantly. Those with the most efficient cost structures will ultimately stay in business. Those with inefficient structures will likely be forced to shut off their machines once profitability dips below break-even levels. While most miners cannot immediately shut off their machines due to contractual obligations with colocation facilitates and utilities, those with the highest costs to produce new BTC will eventually capitulate and go bankrupt[4].

The only defense miners have against decreased profitability is their cost structure which will be the primary determinant of which miners stay in business.

[4] Matt D'Souza, Sam Chwarzynski, Mason Jappa, and George Adams, "Understanding Bitcoin Market Participants – Vulnerabilities in the Price of Bitcoin Driven by Miners" Blockware Solutions, Mar. 17, 2020

Bitcoin's security
Bitcoin has multiple layers of security, which include cryptography, consensus, economic, and social guarantees[5].

With the halving set to significantly impact the mining economy there are implications for Bitcoin's consensus and economic guarantees including:

- A potential drop in hash rate could decrease the amount of hash rate necessary to perform a 51% attack
- An issuance reduction without a counteracting price increase would reduce the costliness[6] attached to each block, increasing the amount of block confirmations necessary for transactions to be considered final.
- Bitcoin becomes increasingly dependent on transactions fees, a potential challenge long-term

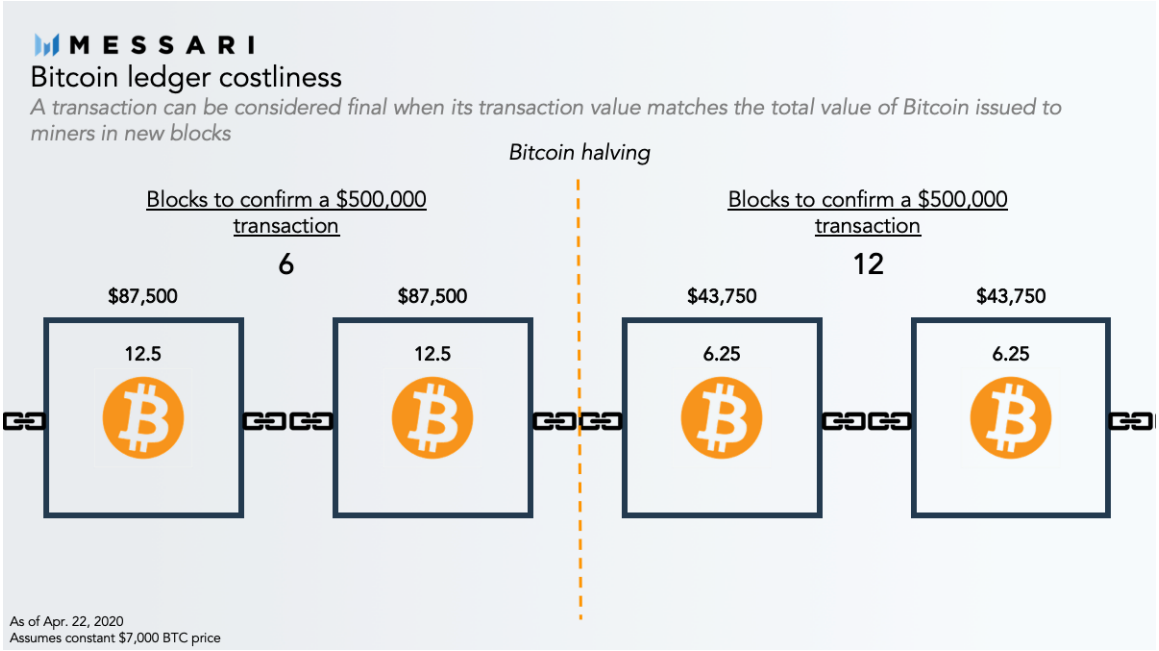
While lower hash rate implies a blockchain is less secure, it's unclear how much hash rate needs to drop for it to make a difference. There is currently no agreement on how much hash rate a blockchain needs to be considered sufficiently secure. Therefore, any analysis on what the effects of a decrease in hash rate would be speculative.

For the sake of perspective, a doomsday scenario where Bitcoin's hash rate declines more than 50% would still leave the network around June 2019 levels. Hash rate has increased substantially since the next generation Bitcoin mining rigs were released just under a year ago.

[5] Hasu, "The Onion Model of Blockchain Security – Part 1" Deribit Insights, Apr. 11, 2020.
[6] Nic Carter, "It's the settlement assurances, stupid" Medium, July 22, 2019.

Bitcoin's security (cont.)

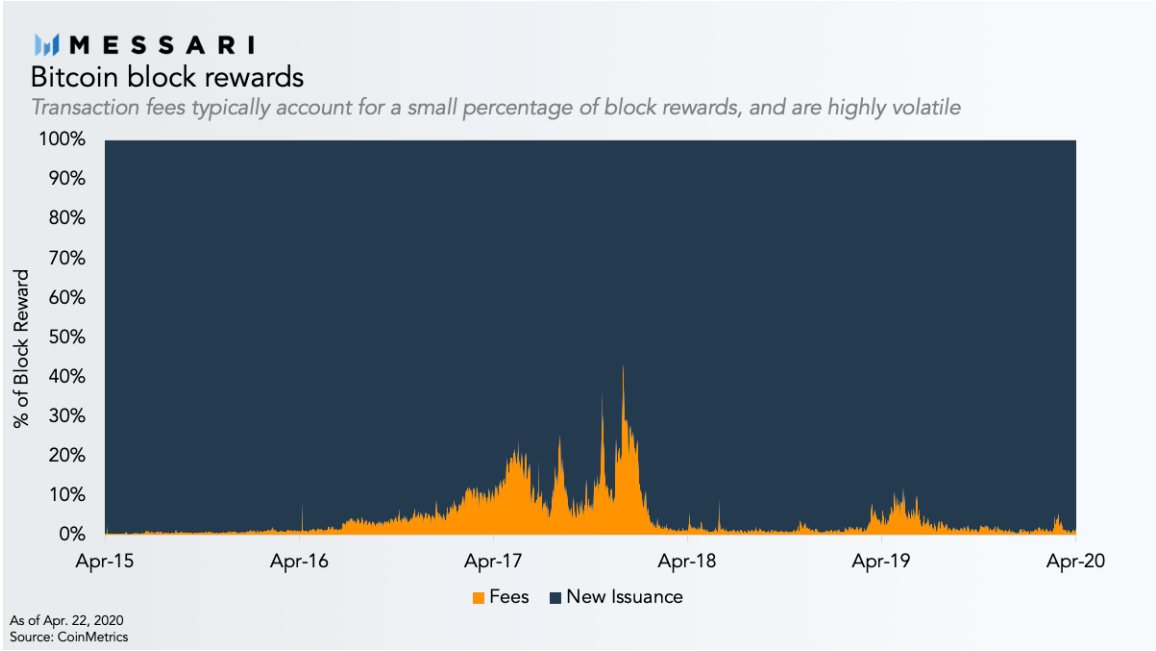
When it comes to the costliness attached to each block post-halving, we can be certain that Bitcoin will require more block confirmations for a given transaction size to be considered final. This is based on the idea that as long as a transaction is worth more than the amount of BTC miners have been paid to mine blocks including it, there is a chance miners could be convinced to mine a new chain to reverse that transaction and profit from doing so.



For most transactions this won't make a difference. The average Bitcoin transaction size over the past two years is ~$7,000 - much lower than the amount of bitcoin miners earn per block. However, for larger transaction sizes that require many block confirmations to be considered final, time to finality will be extended, without an offsetting price increase.

Bitcoin's security (cont.)

Lastly, although this is not a concern in the near-term, each Bitcoin halving incrementally increases Bitcoin's reliance on transaction fees for security. This will represent a major shift in Bitcoin's security model. Instead of users effectively paying miners through inflation they would pay miners through use of block space.



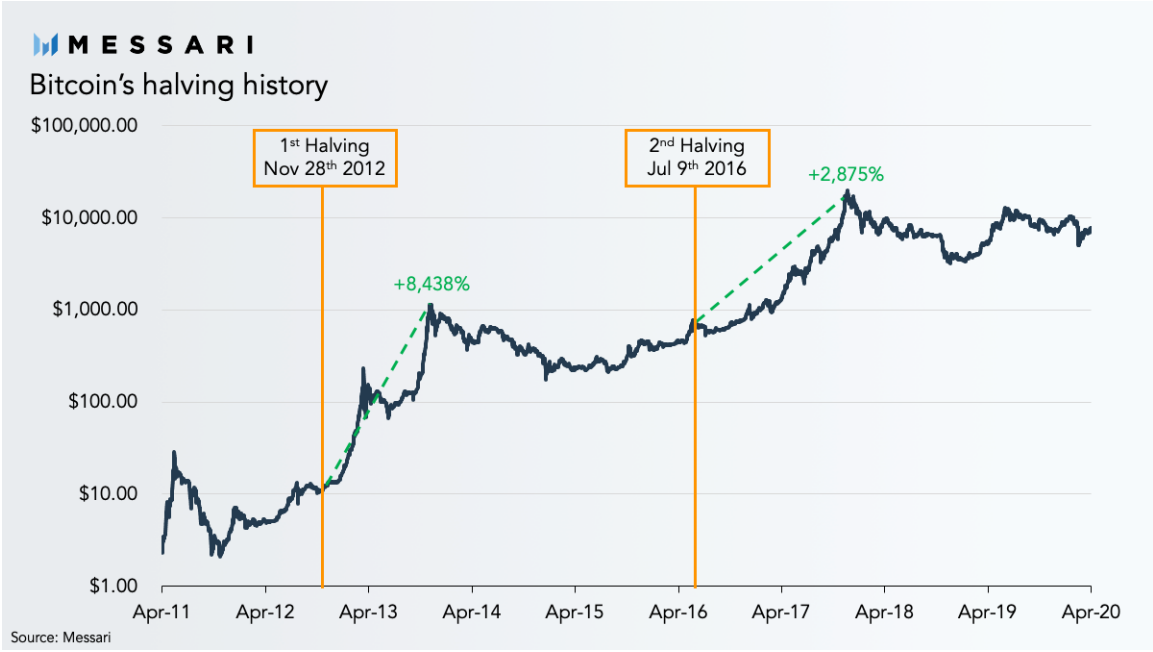
As time passes, Bitcoin's transaction fees will need to rise substantially, to meet current levels. Whether or not this is achieved will depend on future demand for Bitcoin block space.

Part 3: Halving investment theses

An analysis of prominent halving investment models

Halvings and bull markets

The halving has become a focal point of the Bitcoin community primarily due to the historically positive relationship with bitcoin's price. Each of the past two halvings were followed by bull runs that saw price rise thousands of percentage points. Although the data to support this relationship is limited given Bitcoin has only undergone two halvings, it has been enough to convince some people that halvings are a leading cause of bitcoin bull runs. Interest around Bitcoin's upcoming third halving is driven by the expectation that it will produce similar results.



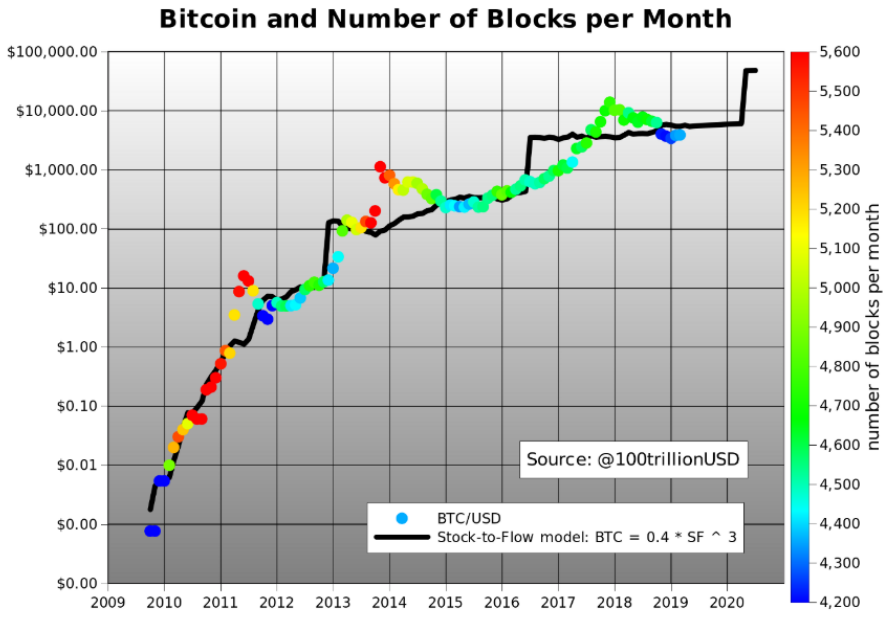
While only a sample size of two there has been extensive research into the impact of the halving and attempts to model its impact on the price of bitcoin. In this section we will focus on two primary theses surrounding the halving, Stock-to-Flow and miner selling pressure, and evaluate the bull and bear case for each.

Stock-to-Flow (S2F) – Bull Case

The most popular argument supporting the halving as a catalyst for the next bull run suggests that a causal relationship exists between bitcoin's price and its supply. Underpinning this causality is a derivative metric known as the stock-to-flow ratio. S2F is a concept that existed long before bitcoin in the precious metals world to measure relative scarcity. The stock is the total outstanding inventory and the flow is the amount of newly mined supply entering the market each year, so S2F gives the number of years of annual production to reach the current supply. The higher the S2F, the more scarce an asset is. For example, gold has the highest S2F of 66 years which is around three-times the next highest metal, silver, at 22.[7]

Since bitcoin frequently draws analogies to gold, analysts have looked at bitcoin's S2F as a meaningful metric to determine its value. First mentions occurred as early as 2014[5] and have started to gain more attention in the popular book The Bitcoin Standard. However, it wasn't until a quantitative model[9] was used by anonymous author Plan₿ who argued for the predictive power of S2F that it became a rallying cry for those believing in the halving bull thesis.

The model posits, since bitcoin issuance is known with near absolute certainty, you can model its S2F into the future with precision. When it's plotted against the price on a logarithmic scale there is an obvious correlation that appears. When used to extrapolate into the future, it predicts a marked price increase after the halving as the flow is cut in half.



Charts made with gnuplot and gnumerics

[7] Peter Sainsbury, "The gold stock-to-flow model" Materials Risk, Sep. 7, 2019.
[8] henqNL, "Stock-to-Flow Ratio of Bitcoin surpasses that of Gold in less than 10 years…" Reddit, July 14, 2015
[9] PlanB, "Modeling Bitcoin's Value with Scarcity" Medium, Mar 22, 2019.

Stock-to-Flow – Bull Case (cont.)

In fact, not only do the two variables appear to be correlated but they are cointegrated, which is a more rigorous statistical relationship between two time series. The concept was succinctly described in A Drunk and Her Dog[10] where a person could be stumbling down a sidewalk walking a dog who is sporadically stopping to sniff around. Even though both movements can be completely random, at any point in time you can conclude that they will still be a certain distance from each other. Therefore, the cointegration of price and S2F implies that in the long run they will not deviate significantly. Should this trend play out, the model suggests bitcoin will rise at least an order of magnitude as it has in the prior two halvings.

Stock-to-Flow (S2F) – Bear Case

Detractors of the Stock-to-Flow model argue that models like S2F have little fundamental basis. The S2F model implies that the relationship between supply and price is strong enough to conclude the former dictates the latter. S2F proponents need to provide underlying reasons for why such a causal relationship would exist. Pointing out historical correlation between bitcoin's price and its S2F is not enough.

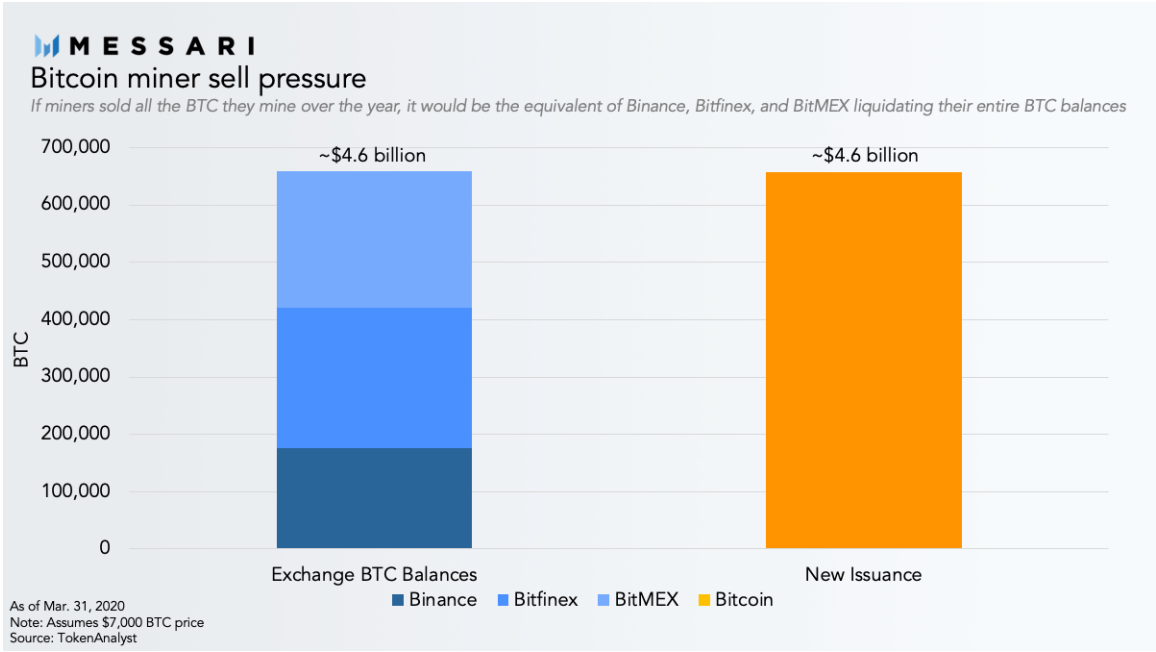
Furthermore, even if a causal relationship did exist, S2F proponents would need to explain how supply reductions represent an informational shock. This would entail disproving the efficient markets hypothesis. The Bitcoin halving is known widely to a great number of rational economic actors, so its impact should already be incorporated into bitcoin's price. The halving after all is part of Bitcoin's predefined issuance schedule.

[10] Michael P. Murray "A Drunk and Her Dog: An Illustration of Cointegration and Error Correction" The American Statistician, Vol. 48, No. 1, February 1994

Miner selling pressure – Bull Case

Another more fundamental rationale behind the halving as a positive price catalyst is the reduction in selling pressure from miners, the largest natural net-seller of bitcoin. Miners have fiat-denominated costs while their revenue comes in bitcoin so they need to constantly sell in order to service their expenses. After the halving occurs, their revenue is immediately slashed in half meaning they only have half as many bitcoin to sell.

With 1,800 BTC currently being created per day, at a price of $7,000 that amounts to $12.6 million in total potential sell-pressure from miners or about $4.6 billion a year. To put this in perspective, the total sell pressure amounts to approximately the aggregate BTC balance of Binance, Bitfinex and BitMex.

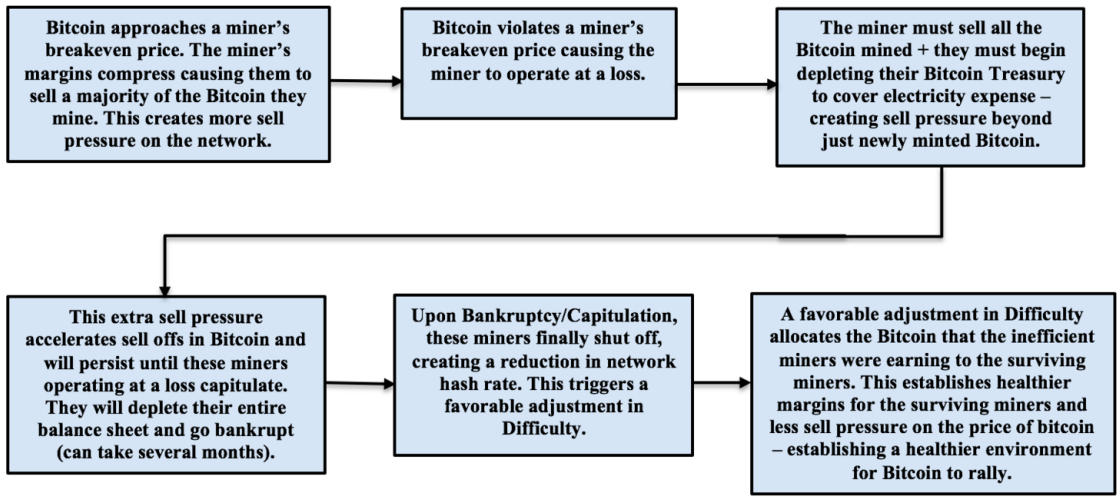


After the halving this annual amount will be reduced to around $2.3 billion. Assuming constant buy pressure, this reduction in selling should lead to at least a marginal rise in price.

Miner selling pressure – Bear Case

Like S2F, miner sell pressure is also a point of contention. While it's easy to claim that Bitcoin miners sell a large amount of bitcoin it's not easy to prove its impact. It's one thing to benchmark the amount of BTC miners could potentially sell over the course of a year to some familiar concept that puts miner sell pressure in perspective, but it's a completely different thing to prove that it makes a big enough difference.

Furthermore, even if we could conclude that miner sell pressure has a significant impact on price, the current outlook would be bearish. Miner capitulation does lead to less sell pressure on bitcoin in the long-run, but in the short-run it is likely to increase sell pressure. According to Blockware Solutions CEO Matt D'Souza, about 27%–35% of the Bitcoin miners could go offline if bitcoin remains below $9,000 for several weeks post-halving. Given that miners cannot shut off immediately, this would lead to miners operating at a loss for potentially several months until they go bankrupt. During this time not only would they be selling all the BTC they mine, but would also sell BTC from their treasury to cover shortfalls and pay for costs associated with winding down their operations.[11] This would put a strain on bitcoin's price for the months following the halving.



[11] Matt D'Souza, Sam Chwarzynski, Mason Jappa, and George Adams, "Understanding Bitcoin Market Participants – Vulnerabilities in the Price of Bitcoin Driven by Miners" Blockware Solutions, Mar. 17, 2020.

Part 4: Opinions from the Messari team

Our take on why the halving matters (or doesn't)

Great marketing, pseudo-science fundamentals - Ryan Watkins
Many bullish halving narratives fall short because of their reliance on wishful thinking and lack of fundamental support.

The S2F model implies that billion, if not trillion dollar bull runs can be engineered through the design of an issuance schedule. Ask yourself, can Bitcoin bull runs, the product of independent actions of diverse market participants, really just be programmed?

The miner selling pressure argument fares little better. The burden of proof is on halving bulls to prove that miners make a significant difference and are indeed suppressing price. In any case, ask yourself, are miners really what's standing in the way between Bitcoin and its next bull run?

At best the halving is a once in every four years marketing event where Bitcoin reminds the world of its superior properties as a monetary good. What makes this years' event so special is that Bitcoin is now part of mainstream consciousness, and that the current macron environment is prime for Bitcoin. Fiat monetary regimes are inflating money supplies at historic rates, while Bitcoin is tightening its monetary issuance down to parity with Gold. The timing couldn't be any better. It's one thing to claim Bitcoin's issuance rate will eventually drop below Gold's, but it's another thing for it to get there. To the extent all this compels new people to make an investment in Bitcoin, the halving is a bullish catalyst.

However, I'm not an optimist. The dark side of all the aggressive monetary and fiscal policy measures is that the global economy is in increasingly bad shape due to the coronavirus. The force of Bitcoin's prime marketing event is colliding with the opposing force of an incredibly uncertain macroeconomic environment that continues to be an overhang on every asset class. It's unclear which force will win out, but to date Bitcoin has yet to convincingly decouple from broader financial markets.

Regardless, at a certain point this industry will need to move beyond pet theories for why Bitcoin's price will rise. There is simply not enough evidence to prove halvings were the cause of the last two bull runs. When you put post-halving returns in historical context, they are undifferentiated from their historical averages, implying that Bitcoin halvings are arbitrary reference points on Bitcoin price charts.

Great marketing, pseudo-science fundamentals (cont.)
An investor could've bought Bitcoin at any point in time before or after the halving and likely have experienced similar returns.

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Benchmarking Bitcoin halving returns

Returns post-halving are not differentiated from typical returns an investor would get buying Bitcoin at any point in time

2011 - 2015	2 Year ROI	1 Year ROI	90 Day ROI	30 Day ROI
Average	5,825%	1,458%	144%	31%
Median	3,163%	349%	23%	4%
2012 Halving	**2,964%**	**8,069%**	**171%**	**9%**

2016 - 2020	2 Year ROI	1 Year ROI	90 Day ROI	30 Day ROI
Average	650%	235%	32%	9%
Median	294%	119%	19%	5%
2016 Halving	**922%**	**284%**	**(5%)**	**(10%)**

Source: Messari

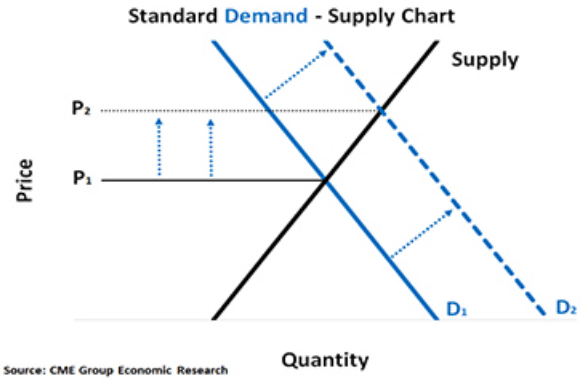
People may do well by tempering their expectations. In the months following Bitcoin's last halving, Bitcoin's price actually decreased, and it was only many months later that Bitcoin would begin rallying as the great 2017 ICO boom kicked off.

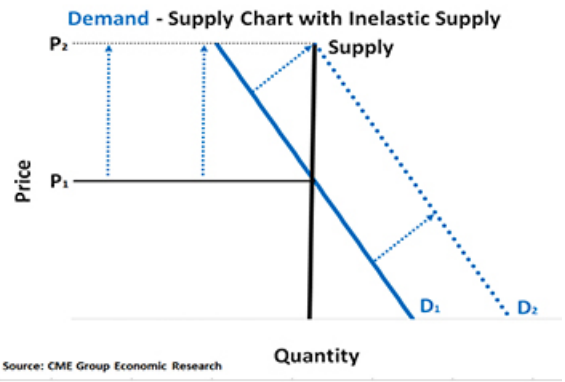
There are plenty of reasons to be bullish on Bitcoin, but I wouldn't bank on the halving being the one. But hey, maybe this time is different

Demand drives bitcoin's price, not supply - Jack Purdy
While the S2F model is often used by halving bulls to prove the price of bitcoin will rise after the halving, a simple lesson from your intro to microeconomics class does wonders to swiftly rebut this notion.

Bitcoin is a terminally fixed supply asset, which makes it a perfectly inelastic good. No matter how much demand for Bitcoin increases or decreases, miners cannot adjust Bitcoin's supply from its predetermined amount. This contrasts with a commodity such as gold, where a rapid price increase would result in a rush of miners looking for more gold which would then increase the supply.

It doesn't take the Chief Economist of the CME Group to make this point, but we included it anyways for those particularly stubborn bulls.[12]





No matter what, the supply of bitcoin cannot decrease. Therefore the only factor capable of increasing the price of a good with perfectly inelastic supply is an increase in demand.

Another way to see that is to think about bitcoin as having mined all 21 million at genesis with an extended vesting schedule. From this lens, it should make more intuitive sense that the vesting rate isn't what would inherently drive up the price. Everyone knows with exact precision how many bitcoin will be released every 10 minutes so when it comes time for that rate to decrease there's no reason to think people will be more inclined to buy it. If the marginal benefit of buying bitcoin outweighs the marginal cost then a purchase will be made. It doesn't make any sense to think that an individual's balance will change once something they know is going to happen, happens.

Is S2F an interesting metric? Absolutely. Quantifying bitcoin's scarcity is an effective tool to demonstrate why people should demand it in the first place. But there remains no logical reason why a known reduction in the issuance rate alone would cause the price to increase.

[12] Bluford Putnam, "An In-Depth Look at the Economics of Bitcoin" Bloomberg, July 13, 2018

Three narratives built on the halving – Ryan Selkis

The Hardening of the Gold Narrative

I wrote in my 2020 Theses that the very best thing we could rally around as an investment narrative was bitcoin's pairing with gold as part of an inflation-resistant basket: a gold-digital gold mix, with bitcoin as the primary beneficiary of the generational rotation of investment assets from boomers to millennials.

This particular halving officially drops bitcoin's monetary expansion rate below the Fed's 2% inflation target for the first time ever.

That's a big deal from a narrative standpoint.

Perhaps I'm overblowing this, but I believe the narrative reinforcement that "bitcoin is now less inflationary than the Fed" is a turning point that marks bitcoin's evolution from beta to production as bona fide digital gold. It's a real-time spin on the long-term "bitcoin has a fixed supply" drum beat.

And in this particular macro environment, that's powerful stuff.

The Introduction of Large New Tribes

The hardening of the digital gold narrative comes at a truly ideal time when institutional investors are actually dipping their toes in the crypto waters. This new tribe is orders of magnitude larger and more influential than the existing and previous investor sets. This tribal expansion has happened (perhaps coincidentally) around the previous two halvings as well.

Following the 2012 halving, we witnessed the expansion from the techno-libertarian crowd to the retail libertarian crowd as Coinbase and Mt. Gox catapulted to prominence, and mining "professionalized".

Following the 2016 halving, we witnessed the expansion of crypto's audience from the retail libertarian crowd to the general retail crowd. The ICO bubble helped because it attracted a mass of new speculators that were really into the 100x returns, but thought they missed the boat on bitcoin.

The last boom blessed the industry with a glut of capital to build the infrastructure needed for the next super cycle. And now this infrastructure is just sitting there waiting for these new customers who could infuse 100x more liquidity into the system than exists today.

Three narratives built on the halving (cont.)

Asset Momentum (aka the virtuous cycle)

Here's where my experience informs a slightly different opinion from EMH hard core-ists: having run large scale conferences like Consensus, I recognize the power of marketing around price hikes and supply shortages.

For illustration, everyone in crypto knew about Consensus 2017 following our successful 2016 event. I logically expected our revenue from 2017 ticket sales would look smoother and less parabolic (i.e. more people buying in advance) than the 2016 revenue curve.

It didn't.

In fact, there is a universal law that all conference organizers know, which is the "doubling date." That is, approximately six weeks in advance of the event, you can take your current ticket revenue, and double it to forecast your final numbers. In crypto, I can tell you the doubling date is closer to a panic-inducing 3.5 weeks in advance.

One of the tricks you pull to extend the doubling date further in is to market artificial scarcity and coming price hikes. The date of the price hikes or exhaustion of lower priced tickets gets people to buy tickets.

I view the halving similarly: as a crypto super cycle marketing event which will pick up steam as the price ticks north.

The market is still under-estimating the impact the hardening of the digital gold narrative, new mega-whale investor entrants, and the momentum trade will have this year. I'm a believer in the EMH, but I'm also skeptical that crypto has become a rational or efficient market.

The halving itself isn't what is interesting about Bitcoin – Qiao Wang
What's truly interesting about Bitcoin's monetary policy is not that it's disinflationary and asymptotically fixed, but that it's predictable and verifiable.

Bitcoin will undergo 33 regularly scheduled new supply reductions until the year 2140. Meanwhile, we have no idea how much QE money will be injected next month, or how much gold is mined every day.

The halving in and of itself is uninteresting. The fact that the halving occurs in a predictable and verifiable way is the real innovation.

It's all about adoption and education - Dan McArdle
I think people who've done their research on bitcoin have fully priced-in the halving. But the world is full of people who either haven't heard of bitcoin, or haven't spent the time and energy to understand it yet. EMH believers argue that most asset managers are already fully aware of bitcoin's fixed supply, and/or the halving details, and that therefore those dynamics are fully priced in globally. I think that's false. Bitcoin is the first of an entirely new asset class. Most asset managers are going to take time before they pay any attention at all (it's still a tiny asset class in the scheme of things), and even more time before they come to an educated high-conviction opinion on bitcoin. I think this process takes decades, so in that sense, it's arguable that bitcoin's fixed-supply characteristics won't be fully appreciated by the market for a long time.

That being the case, I view bitcoin's price growth as a long-term phenomenon driven by increasing awareness and education about bitcoin over time (decades). As more and more people become aware of bitcoin's supply dynamics and appreciate how unique an asset it is, I think price is likely to rise as new entrants take positions. Halvings are the technical means by which fixed supply is implemented in the bitcoin codebase, but the real driver is simply the steady process of adoption and education.

The halving proves that Bitcoin works – Eric Turner
Ignoring the short term arguments around valuation models and price catalysts the simple truth is the halving is long term bullish for Bitcoin because it proves that it works. Every day that goes by with the Bitcoin network producing new blocks adds to its Lindy Effect and the halving is perhaps the most powerful signal. Bitcoin's ability to follow through on defined monetary policy without centralized coordination is what makes it interesting and in today's world an important novelty.

The halving is a stress test for Bitcoin - Wilson Withiam
The upcoming Bitcoin halving does not mean an epic bull run will ensue just because it happened twice before. While these inflation reductions are a sign that Bitcoin is still chugging along (and perhaps a means for celebration), price predictions based on them are relatively meaningless.

What the halving does represent is a built-in stress test for the network. It prompts participants to respond to Bitcoin's security budget being cut in half overnight. If the price can't go up forever, it might be worthwhile to explore methods like increasing economic density that can help sustain Bitcoin's security model without implementing any drastic changes. The halving is, therefore, a reminder of Bitcoin's current status and the work that remains to ensure longevity.

Closing thoughts

No one can predict the future, but everyone can make a prediction. As the halving draws nearer and eventually passes, expect no shortage of predictions on the impact of Bitcoin's third halving. Regardless of whether the halving will have an impact on price, what's more important is what the halving represents.

Bitcoin is perhaps the only monetary asset in the world with a credible assurance that there will only ever be a fixed supply. Each halving is a reminder of Bitcoin's deterministic monetary policy and its guarantee to never change unless by the consent of its community. In a post-coronavirus world with central banks inflating money supplies at historic rates, emerging markets in the early stages of currency crises, and moral hazard entering public consciousness again due to controversial, central bank supported bailouts, Bitcoin's monetary policy may be more important than ever.

Thank you for reading this report. Stay tuned for our follow up report on the aftermath of the 2020 halving.

In the meantime, check out more Messari Pro research, and our screening and charting tools.

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Extra special thank you to Bitstamp for making this report possible

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