Galaxy Digital Research

Dogecoin: The Most Honest Sh*tcoin

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On the back of a major resurgence in cryptocurrency prices, along with retail trading manias fueled by mobile trading apps and Reddit-borne trade ideas, Dogecoin (DOGE) has emerged as the best performing crypto YTD. In this report, we tell the story of the whimsical cryptocurrency and explain why, despite its shortcomings, Dogecoin is one of crypto's most interesting phenomena.

Very Currency, Much Coin

Dogecoin has always been a joke, and the joke keeps getting funnier. The Shiba Inu-themed cryptocurrency, whose community once sponsored the Jamaican Bobsled Team as part of a campaign called #CoolRunnings2, is today worth as much as Lloyds Banking Group, twice as much as Standard Chartered, and almost three times as much as Credit Suisse. This joke currency, created to mock Bitcoin and the rise of altcoins way back in 2013 and 2014, is today worth more than $70B and has rocketed to the top of the crypto list with enormous trading volume, growing ownership, and celebrity endorsements.

The appeal of Dogecoin has always been its honesty. "Dogecoin is an open-source peer-to-peer digital currency, favored by Shiba Inus worldwide," proclaims the official website.[i] Unlike many other cryptocurrency projects, Dogecoin does not seek, or even pretend, to be anything more than to be the world's *most fun* currency. There's no grand vision, no pronouncements about how Dogecoin will change the world. Dogecoin had a *fair launch*, like Bitcoin, meaning there was no token presale, pre-mine, or VC fundraise. Consequently, there's no business development or marketing department promoting the coin for the benefit of insiders. It's ultimately a Bitcoin fork, so while not novel, at least the tech is known and reliable. It's not new: indeed, it's one of the oldest altcoins, more than 1.5 years older than Ethereum. And its founder even disappeared—not as dramatically as Satoshi, of course.

There are major deficiencies. Dogecoin has zero development. Few people run full nodes, and those who do often have difficulty downloading the chain or staying synced with the network. There's no market infrastructure, barely any wallet software, and despite being more than 7 years old, many exchanges still don't support it. There is no *serious* long-term narrative or use-case supporting its wide adoption. And it's not clear whether DOGE holders are *dogmatic* about the coin's long-term prospects.

When we set out to write this report, we expected to find what we've always known: Dogecoin is a joke, but it's also a *joke...* not credible, resilient, or adopted. But as we reviewed the data, we found that, despite its deficiencies, Dogecoin has remarkably strong fundamentals and powerful forces supporting its rise: a genuine origin story, longevity, and a *growing* community of users who appear determined to meme a Shiba Inu-themed global currency into existence. We don't expect Dogecoin to become the world's most valuable cryptocurrency any time soon, but DOGE should not be ignored.

In this report, we tell the story of Dogecoin and offer insights into its use, growth, and maturation from a moderately funny joke to a joke for the ages: **the world's most widely adopted satirical currency.**

DOGE Barks at the Moon

In 2021, the highest returns in the digital assets market have come not from serious projects like Bitcoin and Ethereum, but instead from one of the sector's oldest coins, Dogecoin (DOGE). DOGE is up a whopping 9537% YTD at the time of writing and is the 4th largest digital asset by market cap at more than $70B.

Price of Dogecoin and Select Assets, Percent of Jan 1 Price
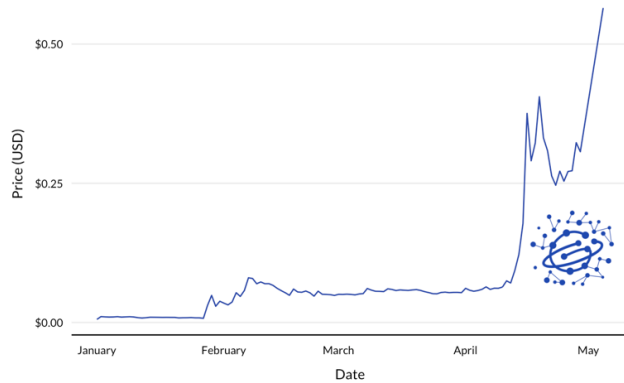Source: Galaxy Digital Research
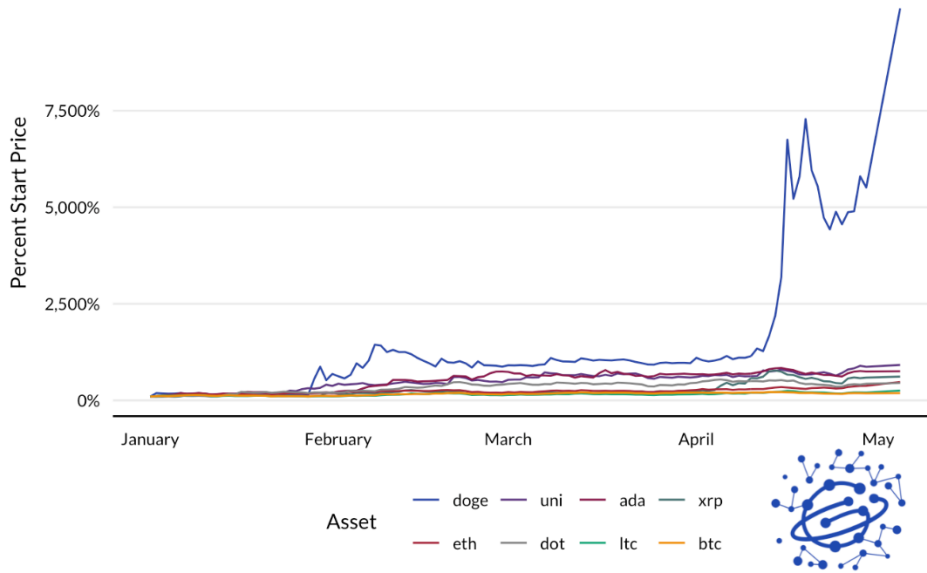
Data: Coin Metrics

Data current as of 10:00 AM ET on 05/04/21

Dogecoin is not trading thin. Volumes have skyrocketed, with as much as $70B trading hands on its busiest ever day recently. Even in the last 24 hours, $15B of Dogecoin has traded hands on the world's most reputable exchanges, compared to $10B for BTC and $22B for ETH.[ii] DOGE is liquid enough to support significant investment.
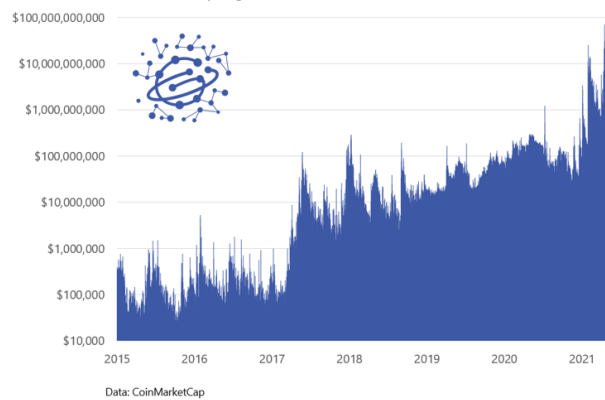

Dogecoin (DOGE) Price, YTD
Source: Galaxy Digital Research

Data: Coin Metrics

Daily Dogecoin Trading Volume (log)
Source: Galaxy Digital Research

Data: CoinMarketCap

Price current as of 10:00 AM ET on 05/04/21, volume current as of end of day 05/01/21

The History of the Doge

Our best attempt at identifying the original Doge meme, source unknown

Launching Dogecoin. Dogecoin was created in 2013 by Jackson Palmer, then an employee in Adobe Systems' marketing department, and Billy Markus, then an IBM software engineer. The pair quite literally created the currency as a joke to capture the spirit of a popular internet meme at the time, the *doge*. The *doge* meme featured a picture of a quizzical Shiba Inu with multicolored text in Comic Sans font depicting the dog's inner monolog.

The first public mention of Dogecoin occurred on November 28, 2013, when Jackson Palmer tweeted "investing in dogecoin, pretty sure it's the next big thing." (Palmer has since deleted his Twitter account and mostly vanished from the internet). Palmer then registered www.dogecoin.com on December 4, 2013, which still provides introductory material for new users. The Dogecoin genesis block was mined two days later on December 6, with the first known price of DOGE established on January 23, 2014 at $0.001540753[iii].

Designing Dogecoin. Dogecoin is a codebase fork of Luckycoin, which itself was a codebase fork of Junkcoin, which was a codebase fork of Litecoin, which in turn is a codebase fork of Bitcoin. Dogecoin originally launched using the Scrypt hash function for its proof-of-work consensus algorithm, before forking to become merge-mined with Litecoin in late 2014. This means that Litecoin Scrypt miners can mine Dogecoin simultaneously at no additional cost. After seeing Palmer's www.dogecoin.com, Markus "tweeted [Palmer] on Thursday, finished the coin Saturday, then we released Sunday." Palmer commented that "initially we thought it would just make the viral rounds on social media, attract a few miners for fun and then slow down. But something really interesting happened—it went from being a humorous take on cryptocurrency to actually driving mainstream awareness of the topic."[iv]

Early growth on social media. The r/Dogecoin subreddit was created on December 8, 2013, and someone made the first post: "Post addresses in here to share and request dogecoin."[v] In 2014, just a few months after the genesis block, the Dogecoin subreddit had over 35,000 members. Today, r/Dogecoin has more than 1.6m subscribers, less than r/Bitcoin's 2.8m but double r/Ethereum's 821k. Later, a "tipping bot" was created to allow Reddit users to send DOGE to each other as a reward for quality posts. "Pretty much everyone who used Reddit had Dogecoin," Palmer told CNET.[vi]

	Major Dogecoin Milestones in the First Year
11/28/13	Jackson Palmer tweets "Investing in Dogecoin, pretty sure it's the next big thing."
12/08/13	Dogecoin announced on BitcoinTalk.org
12/08/13	First block mined at 03:55:27 UTC
12/08/13	r/dogecoin created at 12:36:11 UTC
12/08/13	First Dogecoin forum created at www.doges.org
12/08/13	Official @dogecoin Twitter account created
12/11/13	Current Dogecoin logo created
12/12/13	First exchange lists DOGE (Coined Up)
12/12/13	Version 1.1 of wallet client released
12/14/13	Dogecoin market cap surpasses $1m
12/20/13	Dogecoin supply surpasses 10bn
01/20/14	Over $30k raised for Jamaican Bobsled Team
01/21/14	Dogecoin market cap surpasses $50m
02/14/14	First block reward reduction occurs
02/20/14	Kraken lists DOGE
03/17/14	First block reward era with fixed reward (250k DOGE per block) begins
04/05/14	Litecoin creator Charlie Lee proposes merge mining
04/25/14	Dogecoin conference held in San Francisco
04/28/14	Second reduction in block reward occurs (125k DOGE per block)
05/05/14	Dogecoin-sponsored NASCAR racer Josh Wise finishes 20th at Talledega
05/17/14	Dogecoin-sponsored NASCAR racer Josh Wise finishes 15th at Charlotte, NC
06/24/14	Jackson Palmer unsubscribes from r/dogecoin
07/01/14	Third reduction in block reward occurs (62.5k DOGE per block)
09/03/14	CheapAir.com adds DOGE as payment method
09/11/14	AuxPoW begins at block 371,337
10/02/14	Fourth reduction in block reward occurs (31.25k DOGE per block)
10/21/14	Twitch TV adds DOGE as payment method
11/05/14	$445k raised to fund DogeTipBot
12/06/14	Dogeversary event occurs in San Francisco
12/08/14	Last block of first year is mined at 03:54:38 UTC

Timeline compiled from: Thompson, C. P. (2015). Dogecoin Milestone Timeline. In *Dogecoin: History of the First Year* (pp. 16-19). Self-published.

Donating DOGE. In 2014, the Jamaican Bobsled Team qualified for the Winter Olympics for the first time in 10 years, but they didn't have enough funding to participate. The Dogecoin community, being fans of the movie *Cool Runnings*, decided to post a DOGE address to solicit donations from the community. In just a few hours, #CoolRunnings2 raised $30k worth of DOGE to support the effort. Later that same year, the community banded together again, this time to sponsor racing underdog Jason Wise in several NASCAR Cup Series Events after a Reddit user proposed the idea.[vii]

Over the first year, the Dogecoin community would sponsor many other charitable efforts, including support for the people of Kashmir (Doge4Kashmir), Cambodian primary education (CESHEO), and access to clean water (Doge4Water). The donation

drives were symbolic of the Dogecoin community's early ethos—community, humor, charity. Palmer and Markus did not create Dogecoin because they wanted to be cryptocurrency founders, or to get rich, and the community too had no expectation of profit.
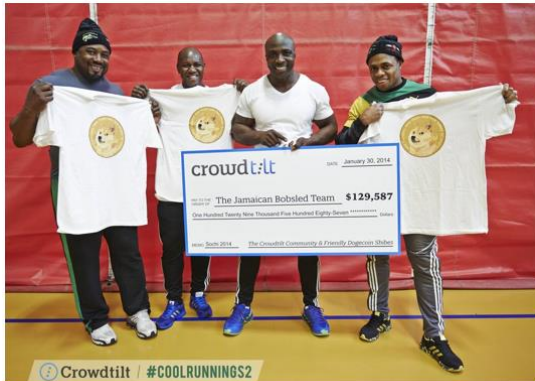
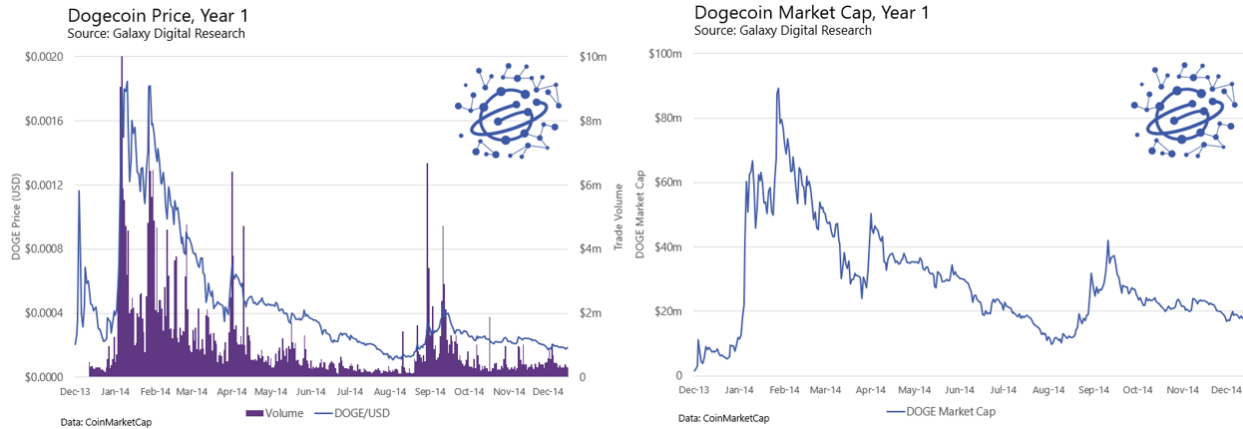Source: Reddit

Source: Washington Post, May 28, 2014

Speculation begins. Dogecoin launched just as Bitcoin was making new a new all-time high in the bull cycle that preceded the 2017 expansion. Bitcoin peaked at $1,156.14 on November 30, just 2 days after Palmer first tweeted the infamous "investing in dogecoin, pretty sure it's the next big thing."

By the end of Dogecoin's first year, at least 33 exchanges had added DOGE trading to their platforms. By our survey, only 5 of those exchanges still operate today (in order of DOGE listing): Poloniex (01/22/14), Bittrex (02/13/14), Kraken (02/20/14), HitBTC (06/03/14) and CEX.io (08/20/14).

Dogecoin Price, Year 1
Source: Galaxy Digital Research
Data: CoinMarketCap
Volume — DOGE/USD

Dogecoin Market Cap, Year 1
Source: Galaxy Digital Research
Data: CoinMarketCap
— DOGE Market Cap

Founders exit. As Dogecoin proliferated out into the cryptocurrency exchange ecosystem, the founders became disillusioned. Dogecoin had become a tool for speculation, rather than just crypto "for sillies," as it was intended. The founders left the project, with Markus saying "when someone puts $20k in… that makes me really, really uncomfortable. I don't want to be a leader of a cult."[viii] Palmer unsubscribed from the r/Dogecoin subreddit on June 24, 2014. In 2015, Palmer announced that he was "taking an extended leave of absence" from the cryptocurrency community, calling the ecosystem "toxic."[ix] Whether for reasons related to Dogecoin or not, Palmer later deleted his YouTube and Twitter accounts entirely.

Development. DOGE is a fork of Luckycoin, which is a fork of Junkcoin, which is a Fork of Litecoin, which is a fork of Bitcoin. The incomplete but illustrative diagram below shows Dogecoin's place among some of Bitcoin's many derivatives.

Coins Derived (Forked) from Bitcoin
Source: Galaxy Digital Research
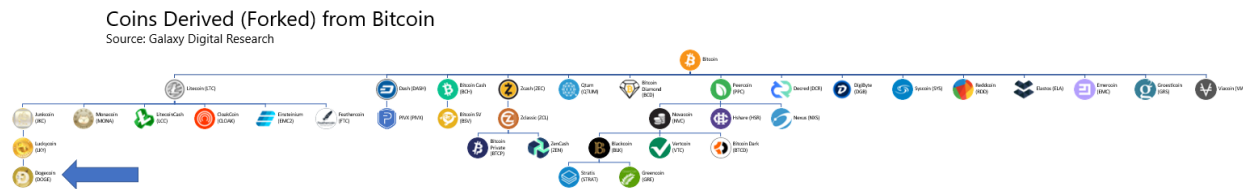
Much of Dogecoin's core architecture, including its scripting language and use of unspent transaction outputs (UTXOs), is ultimately inherited from Bitcoin. The network was initially independently mined with Scrypt, a trait indirectly derived from Litecoin, and had random block rewards, a feature it inherited from Luckycoin.[x] In the currency's early days, the network forked to enable merged mining with Litecoin and replace its randomized block rewards with fixed ones.

Dogecoin's core codebase has been neglected for several years, and there's little development happening on top of the currency. One notorious piece of software that was built on Dogecoin was Truebit's Dogethereum Bridge[xi]: the goal of this project was to link DOGE to ETH to help the latter scale and serve as a pilot for Truebit's scaling solution.[xii] The project no longer appears to be under active development.

The Year of the Doge

Enter Elon. Like many altcoins, Dogecoin lingered on through the years despite low usage and waning interest from the community. It was not until April 2, 2019 when Dogecoin's current champion first made his opinion known. Elon Musk, CEO of Tesla and SpaceX, replied to a request from the official @dogecoin Twitter account that someone become "CEO" and "lead us into the future." In response, Elon said "Dogecoin might be my fav cryptocurrency. It's pretty cool." He would continue to post several more times about Dogecoin that day, eventually being granted the role of "CEO."

Source: Twitter

Covid, Crypto, and Elon Musk. Fast forward a few years to 2020: Covid-19 has ravaged the globe and sent communities everywhere into lockdown. People have turned to new TV shows like *Tiger King*, used Zoom to stay in touch with friends and family, and adopted viral social media platforms like TikTok to share memes and humor.

Bitcoin's third halving occurred as global monetary authorities embarked on an unprecedented loosening. The halving reduced Bitcoin's issuance schedule at the perfect moment to draw a contrast with the actions of central banks, helping spark renewed interest in BTC as a macro asset. Fiscal spigots opened worldwide in an attempt to stem losses from unemployment. Crypto saw massive inflows from both institutions and a homebound retail population while mobile apps like Robinhood, which supports Dogecoin trading, saw huge growth in retail usage.

At the same time, Dogecoin's community-appointed CEO began tweeting heavily about DOGE. Below is a sample of the most viral Dogecoin tweets from Elon Musk, the world's wealthiest person and owner of the 23rd most followed Twitter account (52.4m):
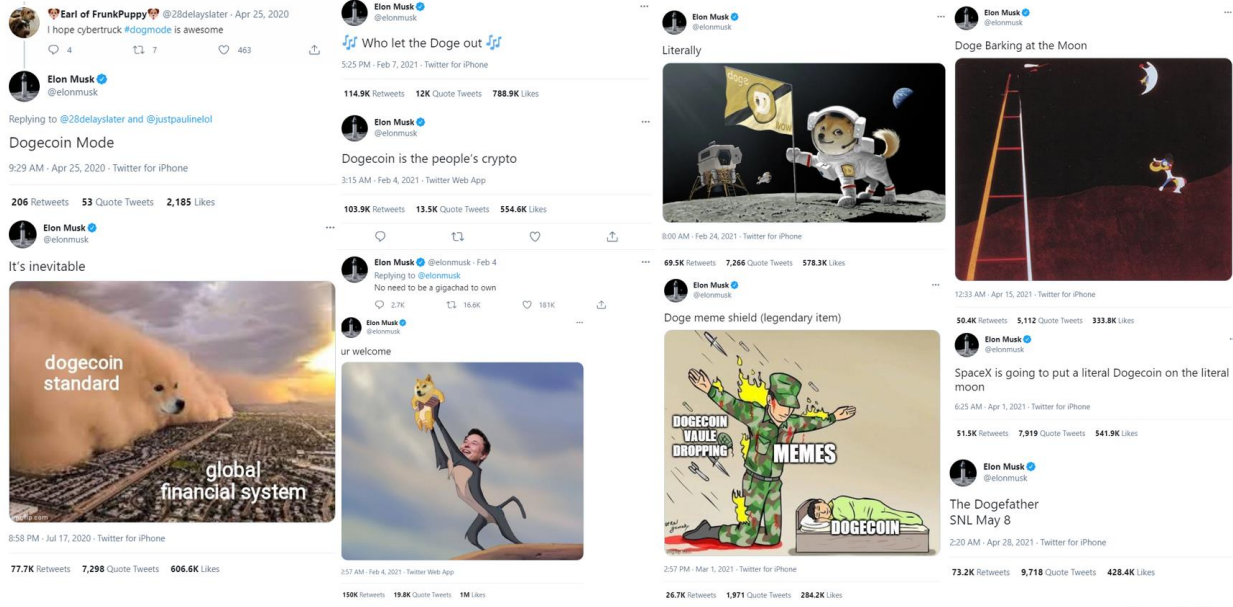
Source: Twitter

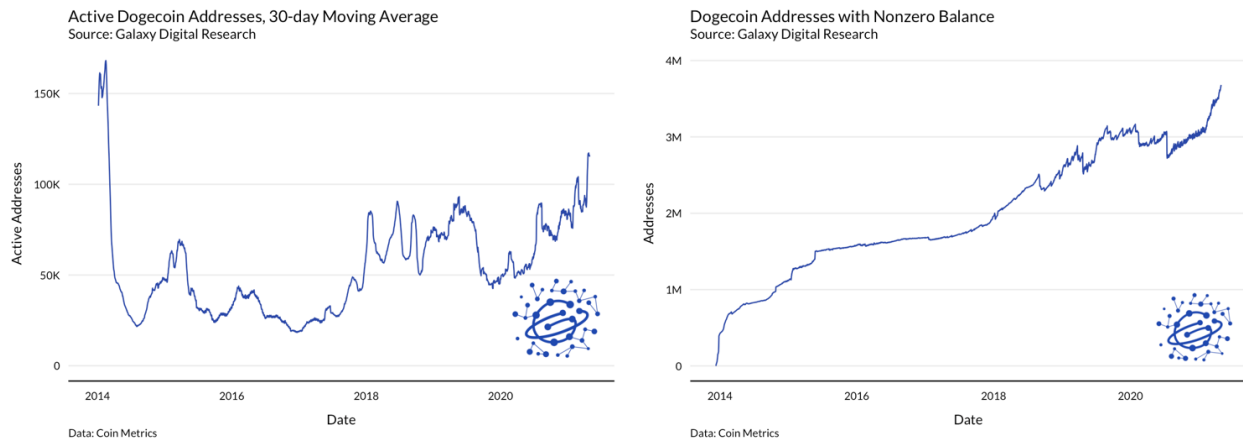Dogecoin has often risen in price on days when Musk tweets about it. A recent sample is catalogued below:



Source: Cryptowat.ch

Dogecoin Metrics

We examine on-chain data to understand the state of the Dogecoin network and its adoption.

User adoption. Both total and active address count have increased through this bull run, indicating increased adoption. The 30-day moving average active address count has passed 100 thousand addresses for the second time in 2021, currently hovering around 115 thousand daily active addresses. There are about 3.6 million addresses holding any amount of DOGE.

Active Dogecoin Addresses, 30-day Moving Average
Source: Galaxy Digital Research
Data: Coin Metrics

Dogecoin Addresses with Nonzero Balance
Source: Galaxy Digital Research
Data: Coin Metrics

Data current as of end of day 05/03/21

Dogecoin supply. With a permanently fixed 10,000 DOGE per block subsidy rewarded to miners approximately every minute, the supply of Dogecoin grows by 14.4m DOGE per day and 5.2B DOGE per year on average. Without halvings, the ultimate supply of Dogecoin is infinite, although the annualized inflation rate reduces as the supply grows.

Dogecoin Supply
Source: Galaxy Digital Research
Data: Coin Metrics
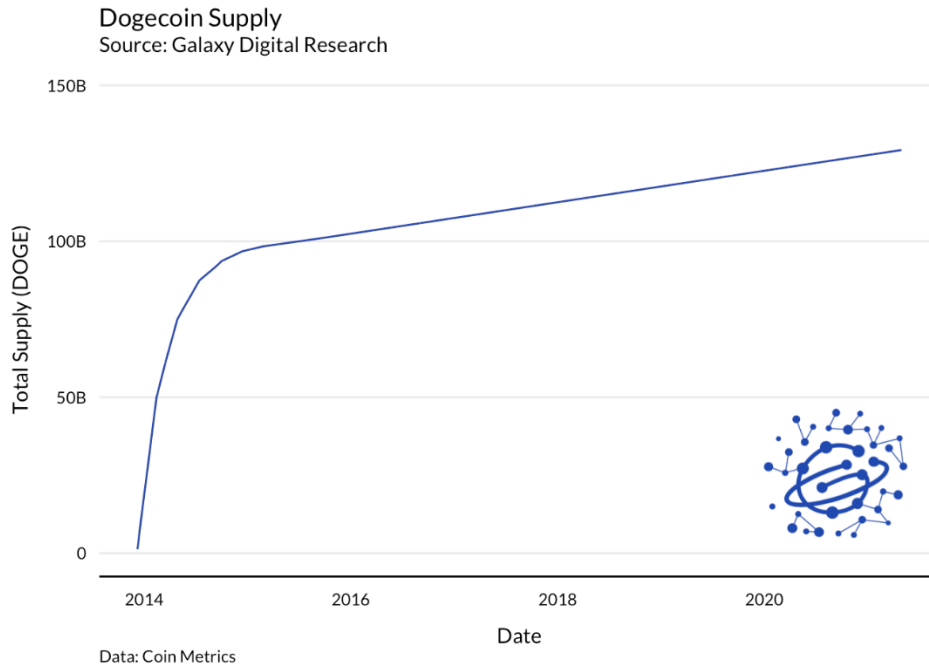
Data current as of end of day 05/03/21

An enormous portion of circulating DOGE has moved in the last year—more than 60% of the coins' total supply. This indicates a significant transfer of coins from older holders into the hands of newer entrants. Were the same true for Bitcoin, it would likely be seen as a bearish indicator by investors, as a large portion of the market views bitcoin as *digital gold*, a long-term savings tool that is being held by more people for longer periods of time. Determining whether this is bearish or bullish for DOGE is not so

straightforward, as it requires judging whether the transfer is putting coins into the hands of holders who will ultimately become long-term investors. Based on pronunciations on social media, with Dogecoin supporters claiming to have "diamond hands," (◇ ✋, in the parlance of our times), it is possible that new entrants have longer term ambitions for the coin than those of prior eras.

### Dogecoin HODL Waves (% Supply Last Moved by Age Band)
Source: Galaxy Digital Research
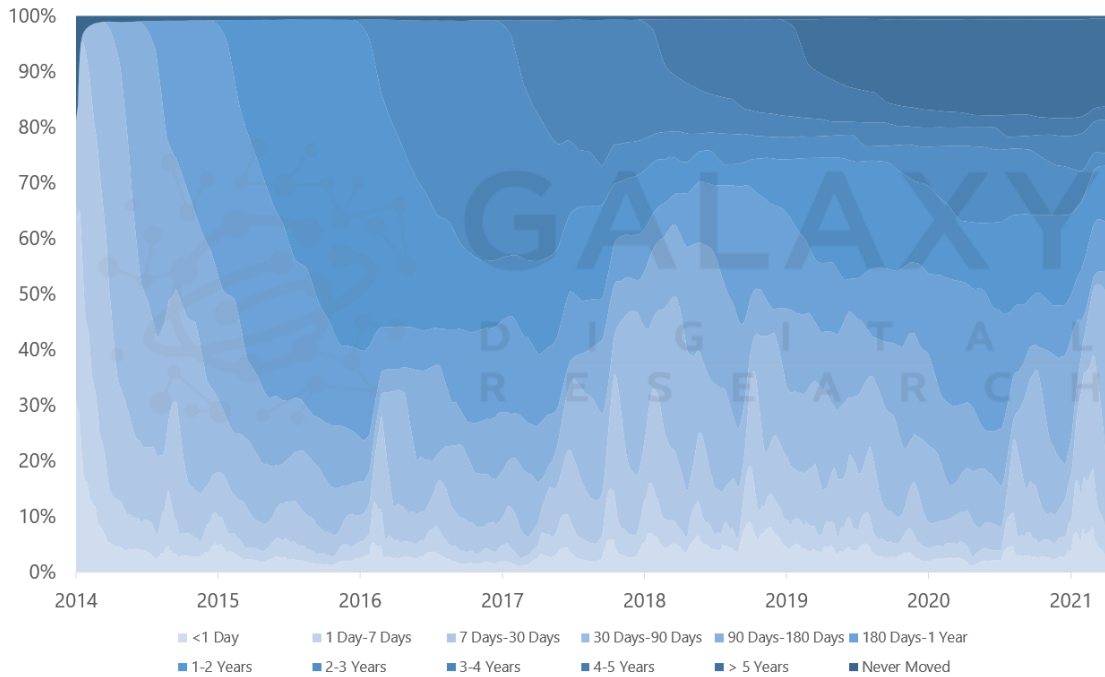
Data: Coin Metrics

Data current as of end of day 04/29/21

Transaction metrics. Transaction count has generally increased throughout the history of the network, with the recent price action coinciding with a run-up in on chain activity.

Dogecoin Transaction Count, 30-day Moving Average
Source: Galaxy Digital Research
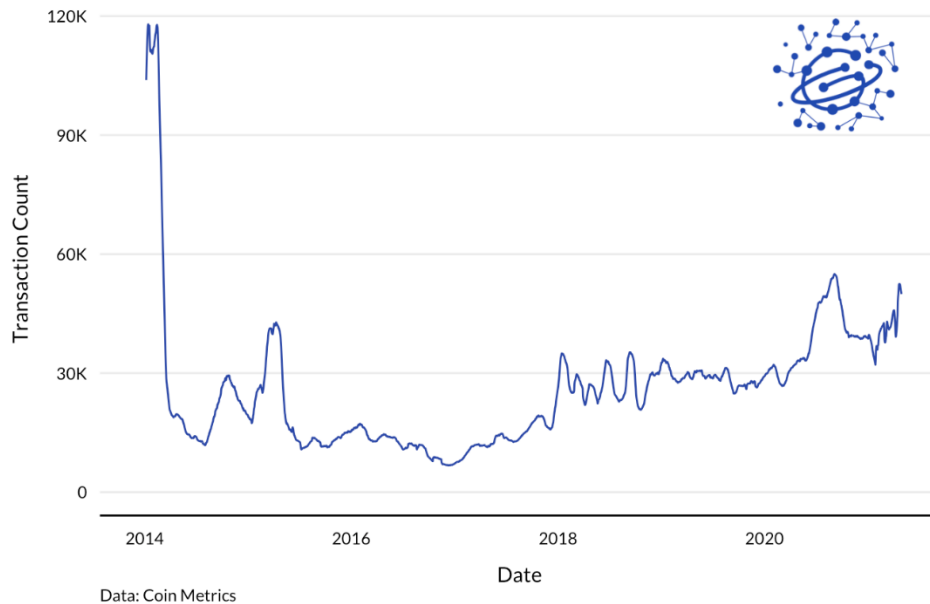
Data: Coin Metrics

Data current as of end of day 05/03/21

USD-denominated transfer value and fees have soared, reflecting the increase in price and activity.

Daily Dogecoin Transfer Value in USD, Adjusted, YTD
Source: Galaxy Digital Research
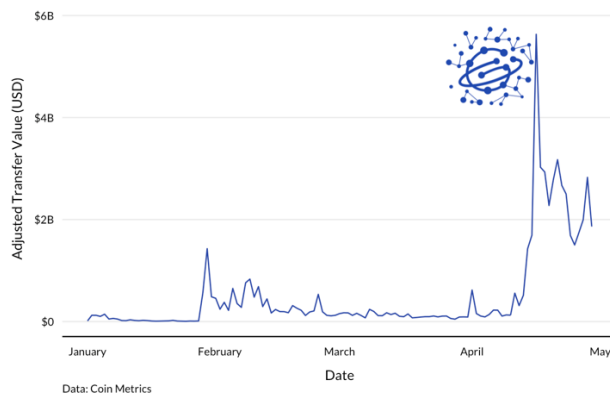
Median Dogecoin Transaction Fee, USD, YTD
Source: Galaxy Digital Research
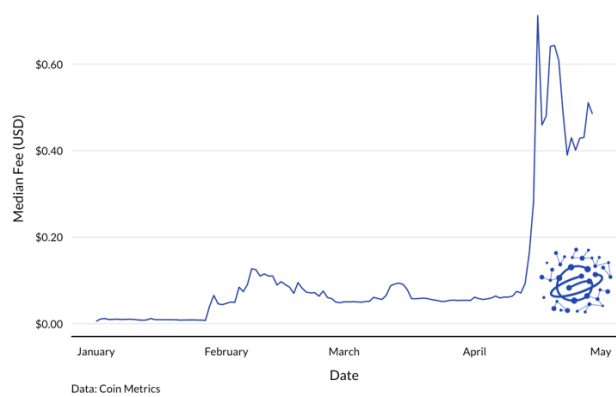
Data: Coin Metrics

Data current as of end of day 05/03/21

Mining. DOGE is merge-mined with LTC—as a result, the network derives its security from Litecoin's. Virtually all Litecoin miners are currently mining DOGE as well.

Dogecoin and Litecoin Hashrate, 30-day Moving Average
Source: Galaxy Digital Research
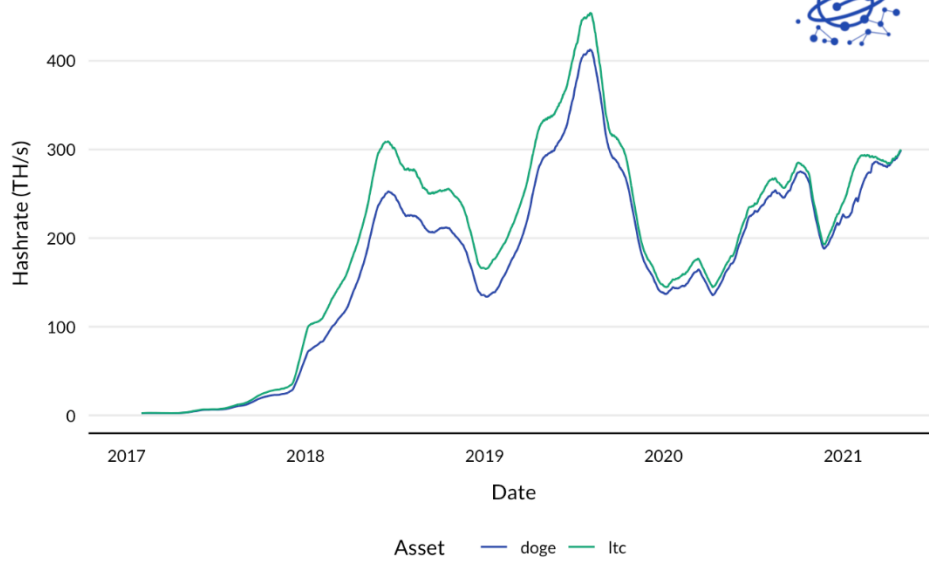
Data: Coin Metrics

Data current as of end of day 05/03/21

Historically, revenue from merge-mining DOGE has served as a small supplemental source of income for Litecoin miners at little marginal cost. With the recent price action, miners are making more money from merge-mining DOGE than they are from mining LTC.

LTC-DOGE Merged-Mining Revenue, 7-day MA
Source: Galaxy Digital Research
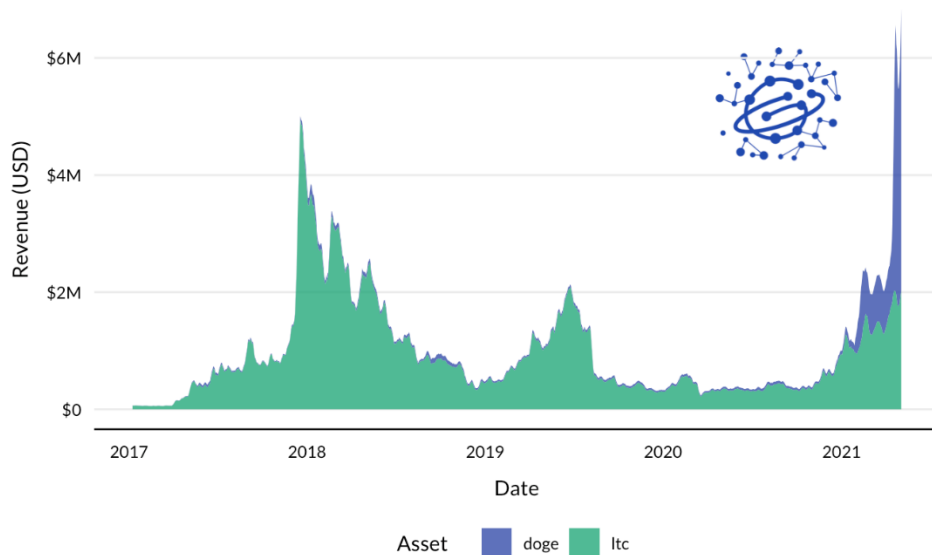
Data: Coin Metrics

Data current as of end of day 05/03/21

DOGE's price increase has also caused it to pass Litecoin in market cap. To our knowledge, this is first the instance of a merge-mined coin passing its base coin in total value.

Dogecoin and Litecoin Market Cap, YTD
Source: Galaxy Digital Research
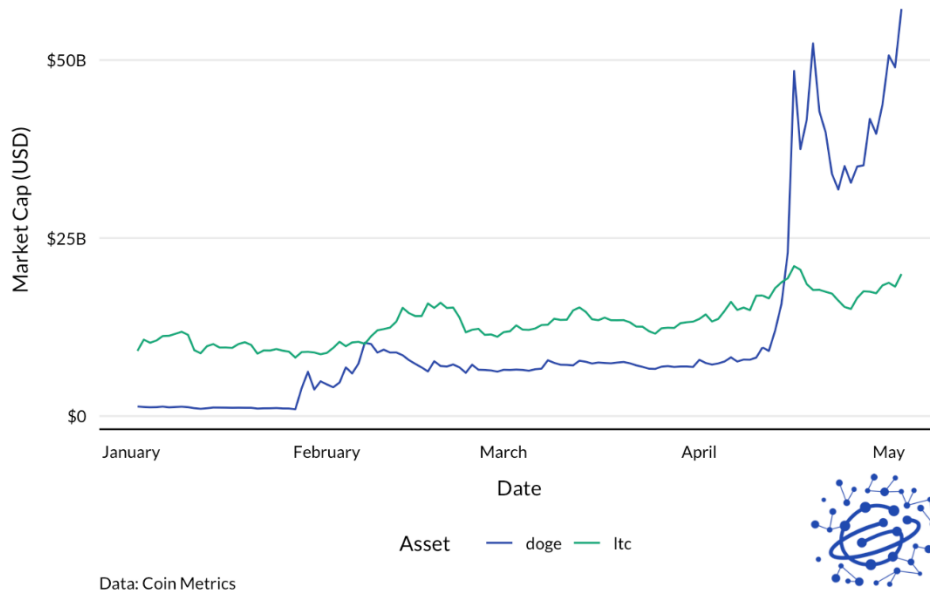
Data: Coin Metrics

Data current as of end of day 05/03/21

Litecoin and Dogecoin use the Scrypt proof-of-work algorithm. With the profitability of Litecoin-Dogecoin merged mining increasing dramatically since the beginning of the year, the price of Scrypt mining rigs on secondary markets has skyrocketed. According to Hashrate Index,[xiii] the average price of the Bitmain Antminer L3, a common Scrypt miner, has increased from $83.26 to $547.71 since the beginning of the year.

Bitmain Antminer L3 Price on Secondary Markets, YTD
Source: Galaxy Digital Research
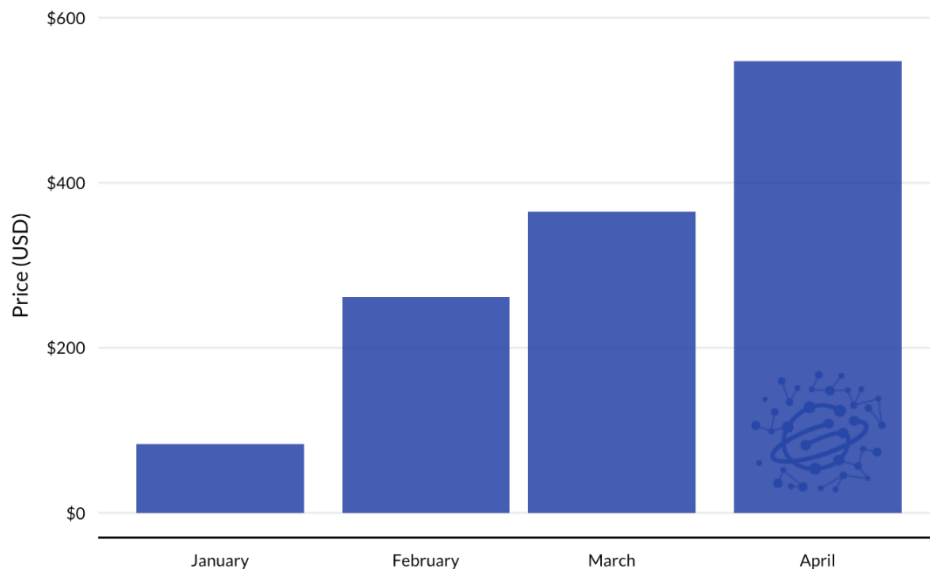
Data: Hashrate Index

Data current as of end of day 04/29/21

Unlike Bitcoin's SHA-256d mining rigs, Scrypt mining machines are typically fabricated on older process nodes. As a result, manufacturers do not need to compete as aggressively with hardware manufacturers from other industries for allocation. With

increasing demand and available capacity, we expect more Scrypt miners to be manufactured and Litecoin and Dogecoin hashrate to increase, even as Bitcoin hashrate faces supply-chain constraints.

Developer activity. Activity in the Dogecoin GitHub repository has been essentially nonexistent since 2017, indicating a general lack of development effort for the project. Whether the coin's resurgence will lead to an increase in developer interest is an open question. Dogecoin's lead maintainer Ross Nicoll recently indicated it may, telling CoinDesk "there was a resurgence in attention and we want to keep the currency operational."[xiv]

Code Additions, Deletions, Commits Per Week

Contributions to master, excluding merge commits and bot accounts
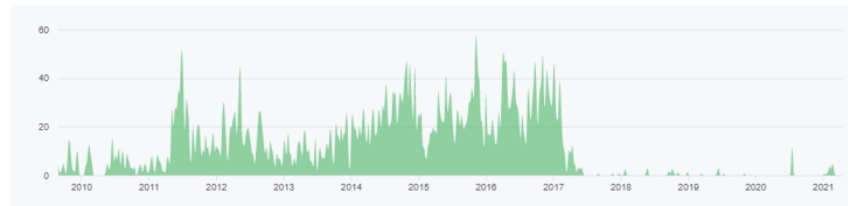
Source: Github

Data current as of end of day 05/02/21

Nodes. In total, as of May 3, 2021, we see 1,195 reachable nodes operating on the network, with 30 distinct operating node versions. The most recent stable release, Shibetoshi v. 1.14.3 comprising 56.1% and the prior version, v. 1.14.2 comprising 28.6% of the network. At the time of writing, only 321 (26.8%) nodes are currently at the chain tip (fully synced with the network), with another 22% synced within 5 blocks of the chain tip. In total, only 48.8% of Dogecoin nodes are currently synced within 5 blocks of the chain tip at the time of writing, with more than half of all nodes behind by more than 5 blocks.

In contrast, 44% of Bitcoin nodes are currently at the chain tip (fully synced with the network), with an additional 48% synced within 5 blocks of the chain tip, resulting in an enormous 92.8% are synced within 5 blocks. Only 7.2% of nodes are more than 5 blocks behind.

Dogecoin's weak node topology speaks to several major deficiencies:

- Dogecoin's 1 minute block time makes latency a near-insurmountable obstacle for most nodes.
- The high number of nodes well behind the chain tip exhibits the low quality of a major portion of the network, exhibiting a lack of community commitment and robustness supporting the network.
- The small number of nodes, and the lack of many fully synced nodes, makes it difficult for new node runners to effectively connect and sync to the chain.
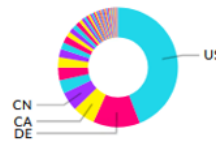

Source: Blockchair

The last point is particularly instructive. As Dogecoin interest grew in Q1 2021, many new users attempted to download and run Dogecoin nodes but faced difficulty. On January 5, GitHub user jrkenn opened an issue in the Dogecoin repository complaining that "I still can not get Dogecoin core to work."[xv] The user continued to explain that, despite having a "1 gig connection," and "bypassing my router" to put the node on a "direct connection to the internet," they saw no improvement in sync'ing with the network. Even after letting the node run for "24 hours," the user saw "no changes whatsoever." Many other users reported the same issue on both GitHub and Reddit.

The issue continues to this day. Galaxy Digital Research attempted to sync our own Dogecoin node (running Shibetoshi v. 1.14.3, the latest release): we were unable to successfully connect to enough peers to sync the chain for several days. The reason for the inability to sync is the lack of sufficiently available and up-to-date nodes on the network. As one GitHub user pointed out, "there are some weird peers with only half the blockchain as their block number… but if they have high connection speed it appears [the node] chooses first on speed rather than a slower connect with a full blockchain."[xvi]

To even begin syncing successfully, like the users on GitHub and Reddit, we were forced to manually import a list IP address for known (i.e., trusted) Dogecoin nodes that possessed the full blockchain and were reachable long enough to sync fully. Even then, we were not able to sync fully in a timely manner. Were we to operate a Dogecoin node for the purposes of sending and receiving transactions, latency issues and the deficiency of the peer-to-peer network would lead us to increase our required confirmation times.
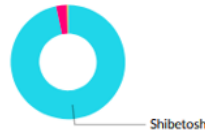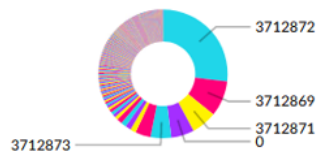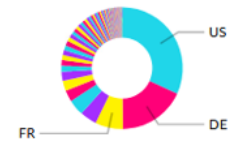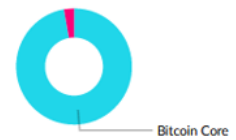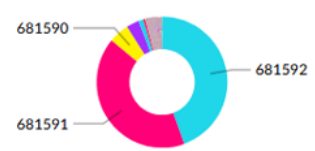
Comparing Dogecoin to Bitcoin

Despite growing usage and ownership, Dogecoin remains deficient to Bitcoin in many ways. The network's immaturity is revealed in qualitative factors like a lack of infrastructure and development. It's also apparent in quantitative metrics like transaction count, transfer value, and centralization of ownership. Most concerningly to investors, an analysis of Dogecoin's security shows its attack cost to be roughly an order of magnitude lower than Bitcoin's.

Lack of infrastructure. Dogecoin lacks robust market infrastructure. There are not institutional dogecoin custodians, brokers, or lenders. While Trezor and Ledger support Dogecoin self-custody through their hardware wallet products, Dogecoin broadly lacks a robust ecosystem of wallet solutions to self-custody and spend DOGE.
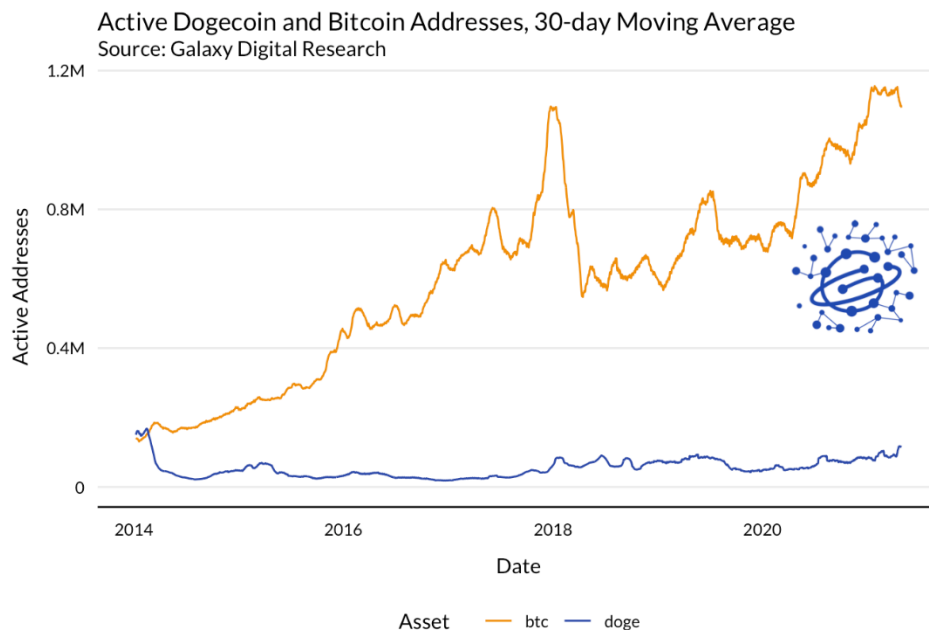
Unsophisticated community. Today, the Dogecoin investor base is primarily retail and recent. In prior crypto eras, Dogecoin holders were comprised primarily of sophisticated bitcoiners and crypto enthusiasts who appreciated the joke, but today the market is dominated by retail investors driven by unit bias and access to platforms like Robinhood.

Dogecoin and Bitcoin Summary Statistics	Bitcoin	Dogecoin
Ticker	BTC	DOGE
Market cap	$1.07T	$57.2B
Current supply	18.69M BTC	129.31B DOGE
Expected supply, 2050	20.99M BTC	280.67B DOGE
Supply cap	21 million	Infinite supply
Price	$55,997.28	$0.53
Block time	10 minutes	1 minute
Algorithm	SHA-256d	Scrypt
Merge-mined?	No	Yes, Litecoin
Hashrate*	167.85 EH/s	320.71 TH/s
Active addresses*	1,124,558	90,385
Annualized inflation rate*	1.83%	3.84%
Supply equity ratio	8.24%	2.09%
Daily fee revenue*	$7,048,374.10	$40,057.30

* 7-day moving average

Source: Galaxy Digital Research. Data: Coin Metrics, Messari. Price: 05/04/21. Other values: 05/03/21.

Lack of development. Dogecoin hasn't seen any meaningful developer activity in years. Bitcoin's development ecosystem is thriving, with core developers frequently receiving grants from individuals, not-for-profits, and large corporations.

User adoption. The number of addresses that hold bitcoin outweigh those that hold Dogecoin by more than an order of magnitude. Significantly more addresses interact with the bitcoin blockchain daily.

Active Dogecoin and Bitcoin Addresses, 30-day Moving Average
Source: Galaxy Digital Research

Data: Coin Metrics

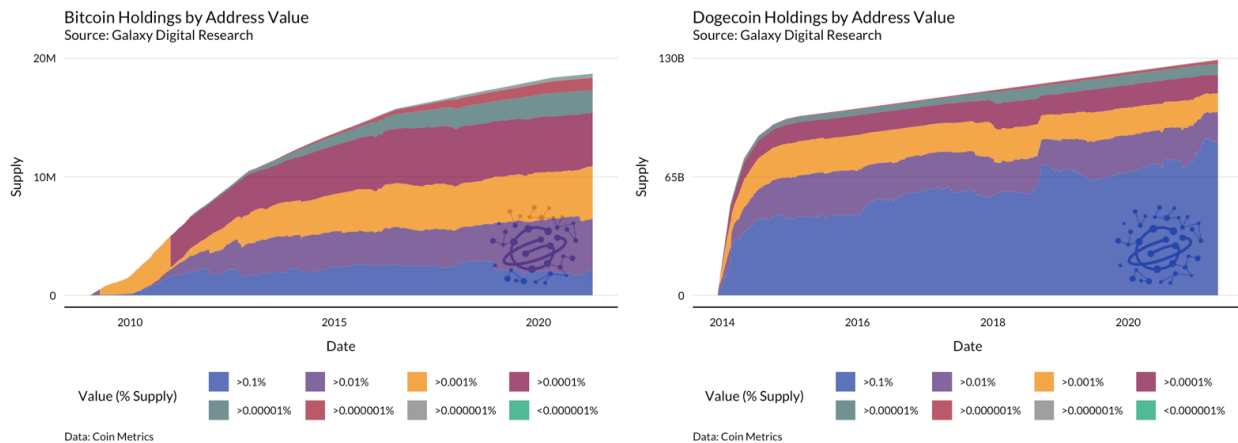*Data current as of end of day 05/03/21*

Supply and Inflation. Dogecoin was originally intended to have a capped supply, like Bitcoin. Early in the network's history, though, community members realized that a bug in the code had caused the supply cap to be unspecified, causing there to be no limit to its future supply. Rather than fix the bug and fork the network, the community moved to maintain the asset's uncapped supply.[xvii]

Dogecoin still doesn't have a supply cap, and the asset's current annualized inflation rate is substantially higher than Bitcoin.

Current Bitcoin Supply & Annualized Inflation Rate
Source: Galaxy Digital Research

Current Dogecoin Supply & Annualized Inflation Rate
Source: Galaxy Digital Research
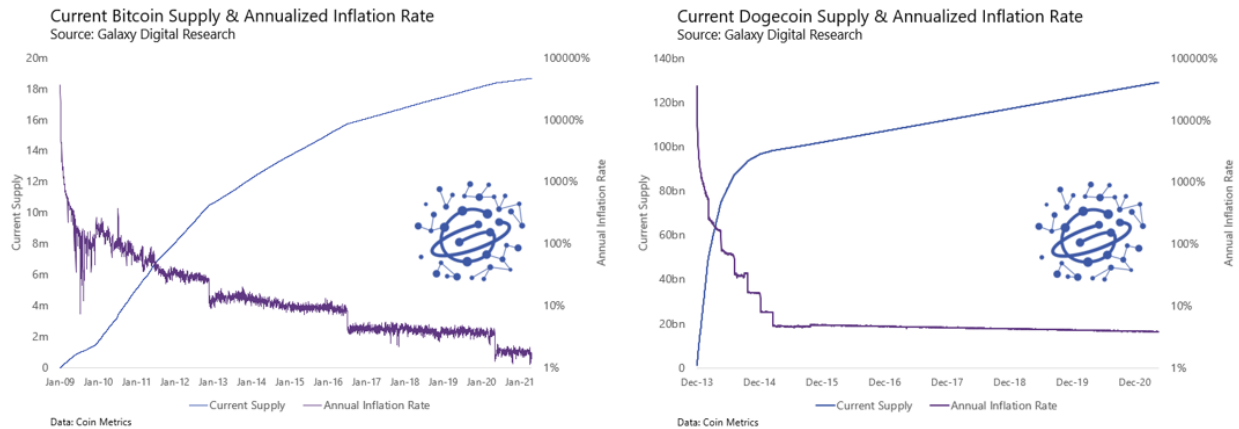
Data current as of end of day 05/03/21

Ownership concentration. The supply distribution of DOGE is skewed heavily toward larger holders. This stands in contrast with Bitcoin, which is much better-dispersed.

Bitcoin Holdings by Address Value
Source: Galaxy Digital Research

Dogecoin Holdings by Address Value
Source: Galaxy Digital Research

Data current as of end of day 05/03/21

Relative to other major assets, Dogecoin's supply dispersion falls somewhere in the middle of the pack. Measured by Supply Equity Ratio, DOGE is more evenly dispersed than XRP and younger assets like UNI and DOT. Supply Equity Ratio (SER) is metric that attempts to calculate the level of inequality of asset ownership by dividing the sum of the supply held by the smallest holders (sum of all accounts with balances less than 0.00001% of supply) by the sum held by the largest accounts (sum held by the top 1% of accounts). By this metric, DOGE trails behind ETH and (especially) BTC in distribution of ownership and is slightly more concentrated than LTC and ADA.

## Supply Equity Ratio of Dogecoin and Select Assets
Source: Galaxy Digital Research
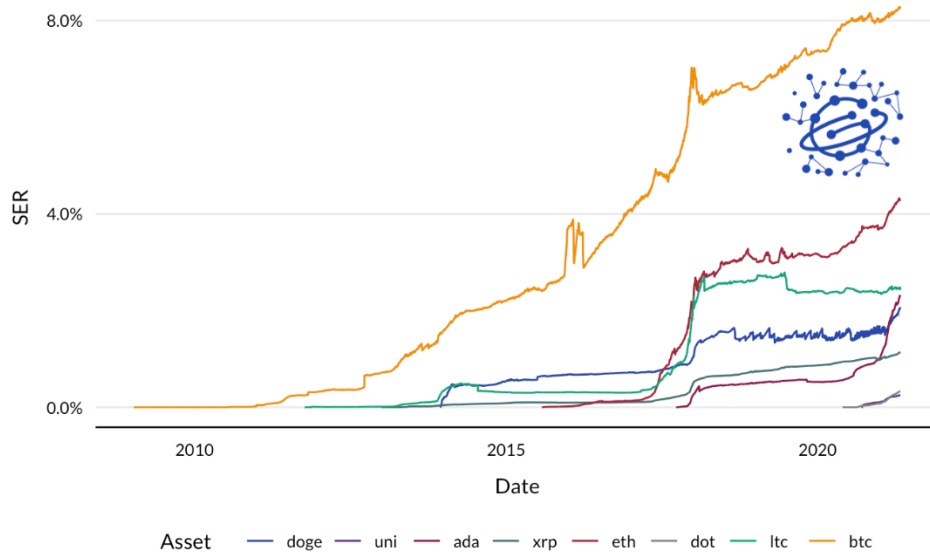
Data: Coin Metrics

*Data current as of end of day 05/03/21*

Transaction metrics. The Bitcoin network dwarfs Dogecoin in both transaction count and daily transfer value. This does not come as any surprise as Bitcoin's ecosystem of wallets, merchants, exchanges, and use cases is extremely developed.

## Dogecoin and Bitcoin Transfer Value, Adjusted, 30-day MA
Source: Galaxy Digital Research

Data: Coin Metrics

Data current as of end of day 05/03/21

Dogecoin and Bitcoin Transaction Count, 30-day MA
Source: Galaxy Digital Research
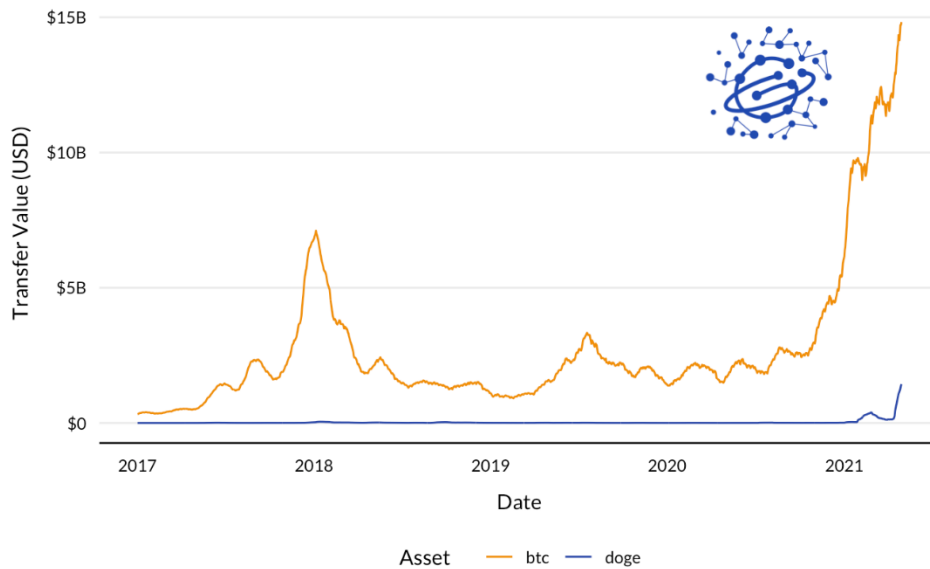
Data: Coin Metrics

Data current as of end of day 05/03/21
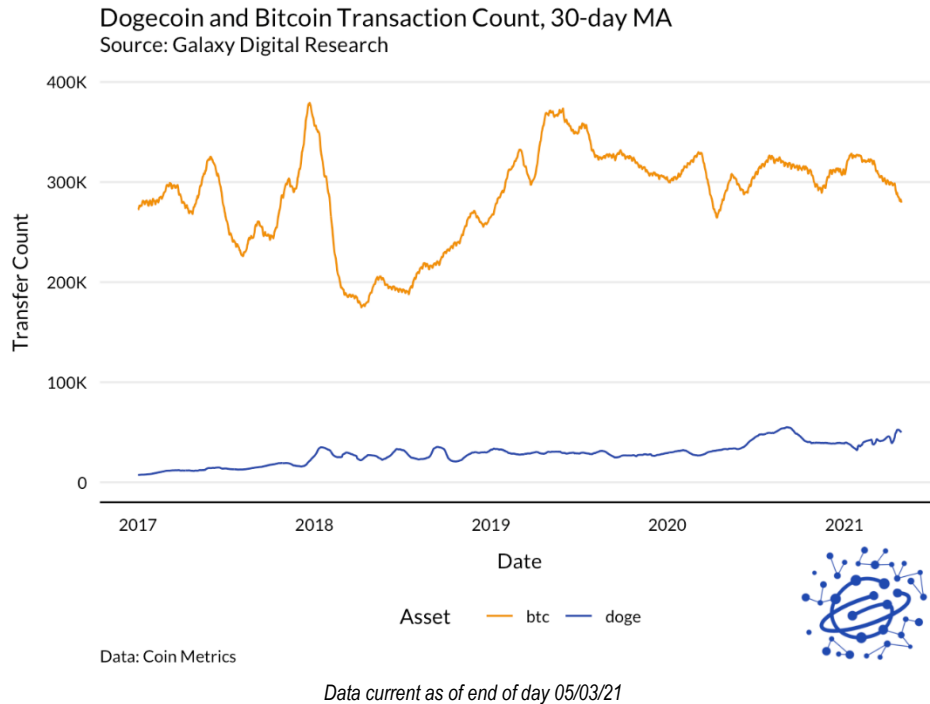
Mining. Using the price of SHA-256d and Scrypt hashpower on NiceHash,[xviii] a hashrate marketplace, HowManyConfs.com estimates the hourly cost of 51%-attacking Bitcoin to be 11 times as high as the cost of attacking Litecoin.[xix] Because Dogecoin is merge-mined with Litecoin, this figure holds for DOGE as well. This estimate suffers from several methodological issues, but the general takeaway is that Bitcoin transactions settle much faster than Litecoin and Dogecoin transactions, despite the latter networks' shorter block times.

Another way to estimate network security is simply to look at miner revenue. In a network's steady state, the economic profits of mining approach zero. This implies that the cost to attack a network is for a day is bounded above by that network's total daily mining revenue. This metric also suggests that Bitcoin is over an order of magnitude more secure than Dogecoin.

Litecoin-Dogecoin and Bitcoin Miner Revenue, 7-day MA
Source: Galaxy Digital Research
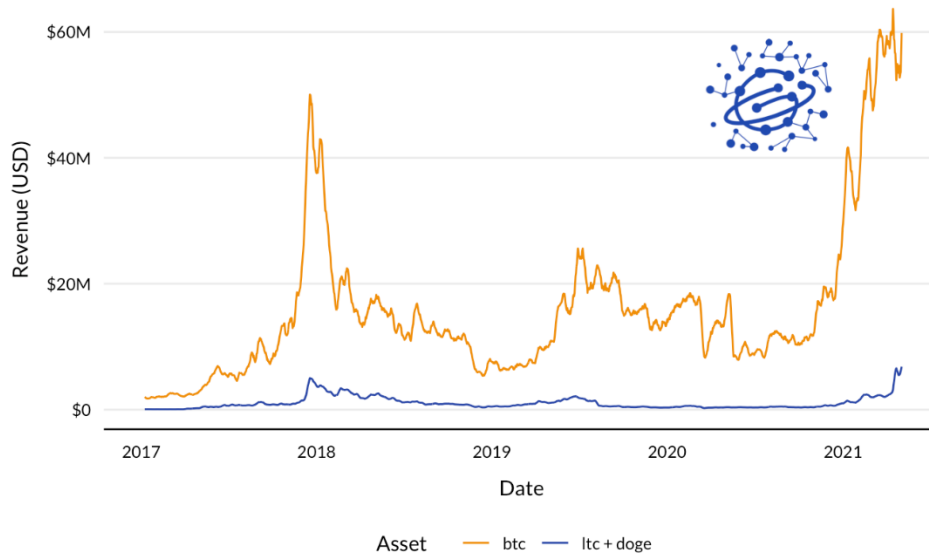
Data: Coin Metrics

Data current as of end of day 05/03/21

Dogecoin and Litecoin have higher inflation rates than Bitcoin, so an attacker could also potentially recoup more of their expenditure by selling the coins they mined. This issue is aggravated by the networks' little-known *coinbase maturity* parameter, which dictates the number of blocks that a miner must wait before spending newly mined coins. The parameter is set to 100 blocks in Bitcoin[xx] and Litecoin,[xxi] and 30 blocks in Dogecoin.[xxii] Because Bitcoin has a 10-minute block time, an attacker controlling slightly over half of the already-online hashpower would need to wait about 33.3 hours before spending mined funds. With Litecoin's 2.5-minute block time, this would take only 8.3 hours, and with Dogecoin's 1-minute block time, 1 hour.

Because newly mined coins on DOGE mature faster, the collateral damage of an attack on Dogecoin would also be greater. Funds sent by miners within the attack window can evaporate, short-changing the recipient. A relatively shallow 51% attack on DOGE could result in permanent loss of funds, even if both the sender and recipient behave honestly.

Bitcoin offers stronger settlement assurances. In a 51% attack less than 100 blocks deep, transactions sent by an honest actor will eventually settle, and the recipient will be made whole.

Monetary flexibility. Dogecoin's unreasonably short maturity window wasn't the only bizarre design choice made by the creators of the asset. Dogecoin initially launched as an independently mined asset with random block rewards of between zero and 1 million DOGE, a feature it inherited from Luckycoin.[xxiii] Because the source of this randomness was the hash of the previous block, though, it was possible for miners to know the reward of the block they were mining in advance.

Some miners, like F2Pool, gamed this feature to only mine blocks with an above-average block reward.[xxiv] After this was pointed out in a Reddit post by u/paul_miner,[xxv] the community moved to fork the network and remove the random block reward.

The decision to adjust a key parameter like the block reward is should not be made likely. While expected total issuance remained the same, this change fundamentally altered the network's mining economics.

Bitcoin has also seen user-driven changes to its base-layer economics, most famously through the introduction of segregated witness (SegWit). Unlike the move to a deterministic block reward, though, SegWit impacted only the network's fee economics, not the rate at which new coins were issued.

Conclusion

Dogecoin is one of the oldest cryptocurrencies, founded two market cycles ago by two global citizens with nothing more in common than the love of a good joke. They bonded over humor, connected over the internet, and developed in the open. Over the years, the coin has survived, despite the founders' exit, its flimsy network topology, a lack of development, and its seeming purposelessness. But upon reflecting on Dogecoin in 2021, we can say a few notable things about DOGE:

- DOGE is the best performing major digital asset year to date.
- More people than ever before own DOGE.
- There are more addresses than ever before interacting with the Dogecoin blockchain.
- The Dogecoin network has never settled as much value as it does today.
- It has never been more profitable to mine DOGE (and mine LTC and DOGE).
- The world's richest person has taken up the community-bestowed title of "CEO of Dogecoin."

And yet Dogecoin remains deficient when compared to Bitcoin:

- Bitcoin is the most widely dispersed, least concentrated digital asset.
- Bitcoin is much more heavily used, with an order of magnitude more daily active addresses than Dogecoin, and more than 6 times as many daily transactions.
- Bitcoin transfers and settles several orders of magnitude more value per day than Dogecoin.
- Bitcoin is among the most actively developed projects in the digital asset ecosystem, while Dogecoin is among the least actively developed.
- The Bitcoin network is comprised of the most widely distributed network of nodes of any digital asset, while Dogecoin's node topology is small and lacks robustness, with most of the network's nodes unable to remain synced to the tip of the blockchain.
- Bitcoin boasts a diverse and extremely robust ecosystem of wallet, market, and network infrastructure.
- Bitcoin is significantly more secure than Dogecoin, with attack cost at least 11x higher.

Despite these deficiencies, though, Dogecoin is an admirable project clearly capable of rallying significant support. Unlike many projects in the cryptocurrency ecosystem, Dogecoin does not thrive on grand pronouncements of a better future or major technological breakthroughs. Instead, Dogecoin has one simple purpose: to be the world's most fun currency. It is a goal that seems too good to be true, one that you would assume comes with a hidden agenda. But with no pre-mine or ICO, Dogecoin's fair launch positions it more closely to Bitcoin than most other projects in the space, ensuring that no hidden group of insiders stands to benefit disproportionately from its rise.

Aristotle said, "the gods too are fond of a joke," and it's clear the cryptocurrency gods continue to favor Dogecoin. DOGE is likely to live on as long as Bitcoin lives, and as long as jokes are funny. It is perhaps the purest "gallows humor" investment vehicle ever created, mocking a frothy market with its playful indifference. In our view, current Dogecoin volatility is fueled by mania, but it is likely that Dogecoin will continue to be part of this cryptocurrency story over the long run, always in Bitcoin's shadow, but always lurking and periodically outperforming to surprise us all. DOGE has a long history of self-awareness and simplicity that makes it an attractive tool for expressing a wry cynicism about the state of the world. The coin offers a certain honesty that resonates in a complicated world and an often duplicitous cryptocurrency ecosystem. Most assets cannot rival that honesty, and Dogecoin's longevity is ensured so long as one truism remains: people love a good joke.

[i] Dogecoin.com. (n.d.). Retrieved April 29, 2021, from http://www.dogecoin.com/

[ii] Based on data from Messari

[iii] Based on data from Coin Metrics.

[iv] Pinguino. (2013, December 17). The humans behind Dogecoin. Retrieved May 01, 2021, from https://spelunk.in/2013/12/17/discover-dogecoin-currency-for-the-internet/

[v] Post addresses in here to share and request dogecoin… (2013, December 9). Retrieved April 29, 2021, from https://www.reddit.com/r/dogecoin/comments/1sf9fo/post_addresses_in_here_to_share_and_request

[vi] Serrels, M. (2021, April 21). Dogecoin: Inside the JOKE cryptocurrency that somehow became real. Retrieved April 22, 2021, from https://www.cnet.com/news/dogecoin-how-a-meme-became-a-real-cryptocurrency/

[vii] Guys, lets do it! doge nascar style! (2014, March 17). Retrieved April 29, 2021, from https://old.reddit.com/r/dogecoin/comments/20mwde/guys_lets_do_it_doge_nascar_style/

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[x] Epicenterbtc. (2019, April 01). Why Dogecoin forked Luckycoin, Litecoin and Bitcoin – Jackson Palmer ON EPICENTER. Retrieved May 03, 2021, from https://www.youtube.com/watch?v=GO3p1zyc7-o

[xi] https://github.com/dogethereum/docs

[xii] Hertig, A. (2018, February 20). Doge is Helping Ethereum solve its biggest issue. Retrieved May 03, 2021, from https://www.coindesk.com/dogecoin-helping-ethereum-solve-biggest-issue

[xiii] http://hashrateindex.com/

[xiv] Harper, C. (2021, March 30). Dogecoin's surging PRICE Resurrects its tech development. Retrieved May 02, 2021, from https://www.coindesk.com/dogecoin-surging-price-resurrected-technical-development

[xv] U/jrkenn. (n.d.). Will not connect to network, connecting to PEERS · Issue #1659 · dogecoin/dogecoin. Retrieved May 03, 2021, from https://github.com/dogecoin/dogecoin/issues/1659

[xvi] U/couchdive. (n.d.). Will not connect to network, connecting to PEERS · Issue #1659 · dogecoin/dogecoin. Retrieved May 03, 2021, from https://github.com/dogecoin/dogecoin/issues/1659#issuecomment-754902041

[xvii] https://github.com/dogecoin/dogecoin/issues/23#issuecomment-33893149

[xviii] https://www.nicehash.com

[xix] https://ww.HowManyConfs.com

[xx] https://github.com/bitcoin/bitcoin/blob/master/src/consensus/consensus.h

[xxi] https://github.com/litecoin-project/litecoin/blob/master/src/consensus/consensus.h

[xxii] https://github.com/dogecoin/dogecoin/blob/7b81f4de0a006a6c01b88c79b6ab34a921eb86b5/src/chainparams.cpp

[xxiii] Epicenterbtc. (2019, April 01). Why Dogecoin forked Luckycoin, Litecoin and Bitcoin – Jackson Palmer ON EPICENTER. Retrieved May 03, 2021, from https://www.youtube.com/watch?v=GO3p1zyc7-o

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