



Crypto Theses for 2022

Key trends, people, companies, and projects to watch across the crypto landscape, with predictions for 2022

Welcome

Ho, Ho, Ho.

I'll keep this brief, since the rest of this report is not.

The *Theses* started as a tweet thread four years ago on New Year's Day. Along with the rest of the crypto industry, the report has exploded in size and complexity each year since. I write it for our team - to highlight the amazing work they've done throughout the year, and to synthesize the crypto chaos for any new hires. I write it for myself - to organize my monkey mind and create a mental model for crypto and an index of the best available research.

And, of course, I write for you. Whether you're a crypto novice or a multi-cycle veteran, I try to deliver a free, comprehensive 201-level crypto course with 101-level intros and links as an annual holiday gift to those who will find it helpful.

In return, you get to yell at me for typos (thanks!), mis-summarizing your favorite coins (do better marketing!), omitting the #246 asset by market cap (I'm not a short-seller!), and copy pasta-ing other people's ideas throughout (good artists copy, great artists steal).

A couple of disclaimers before you dive in:

1. The alpha in this report is free, and many have gleaned insights from past reports that helped them make money, but nothing herein is investment advice. Be an adult.
2. I stand on the shoulders of giants. In certain chapters, I borrow liberally from other authors who have already delivered amazing insights on a given topic. [Nic Carter](#) and [Lyn Alden](#) in the bitcoin section. [Punk6529](#) and [Ben Yu](#) in the NFT section. [Watkins](#) and [Wilson](#) and [Mason](#) and [Roberto](#) et al in the DeFi, ETH & Friends, and DAO sections. [Balaji](#) and [Chris Dixon](#) throughout. By reading on, you accept my terms of service, which includes the provision that any accidental plagiarism of the above cited authors is unintentional and will be corrected ex post facto. (Do you want a free report or do you want MLA-level standards and the boredom that comes with mind-numbing citation?)
3. This beast took me ~250 hours to write (8-10% of my annual bandwidth). Every year, I secretly root for it to flop to spare me from the temptation of writing another one. If you like the report, you can thank the Messari team for running the business in my absence last month. They accept thank you's in the form of [followers](#) and [Pro subscriptions](#). I accept thank you's in the form of 5-6 figure [Enterprise](#) subs and [Hub](#) memberships.



4. I own assets discussed in this report. My core holdings are disclosed at the end of Chapter 1 (along with those of the rest of the Messari team), and any angel or liquid investments I have made to date are marked with an asterisk. No conflicts, no interest.

This report caps an epic year for crypto and for Messari. In 2021, we grew the size of our team ~4x and revenues ~8x. We [raised a Series A](#), and launched a killer [new product](#) every quarter - Intel in Q1, our Analyst Hub in Q2, Mainnet in Q3, and some new tools for DAOs that we'll be unveiling next week. Next year will be even bigger. **We're hiring**. A lot. And we pay \$10,000 per engineering referral if you know any good ones (or are one yourself).

We're also doing something fun this year, and auctioning off a bunch of [Theses-related NFTs](#) for charity. Our "heroes" collection includes artwork for the top people to watch this year. They'll get a special personal edition of the art as a keepsake, but the remainder are 1/1 NFTs that we're auctioning through our partner OpenSea. (Commissioner Peirce's NFT looks particularly rare.) We also have a series of battlescenes in the collection that are pure fire. Thanks to [Jaen](#) for the inspiring work and inspiration. This is an NFT test run for us, and we'll have more to come. You might want to buy an annual [Pro subscription](#) to keep up with 2022 developments. Just saying.

As always, I am humbled you would consider reading this report and appreci...oh who am I kidding, this report is f*cking incredible, and like Kanye [at one of his concerts](#), I'm jealous you get to read it with fresh eyes.* Because I'm honestly sick of looking at it.

Happy Holidays, próspero año y felicidad, and as always, wear a helmet.

-[TBI](#)

**Kidding. Kinda.*



0.1 Why We're Here



(This was [written in five minutes](#) and it's better than this report, which is why I self-RT'd.)



Table of Contents

1. Top 10 Narratives & Investment Themes	7	4. American Crypto Policy	51
1. The Collapse in Institutional Trust	8	1. The American Battleground	52
2. Crypto/Web3 is Inevitable	9	2. Real Risks & Self-Regulation	53
3. Bridges and Nifties and DAOs	10	3. FSOC & SEC Dominance	55
4. Decoupling of Cryptos	11	4. The Crypto Coalition	56
5. Permanent (Venture) Capital: In, Up and Down, Never Out	12	5. Regulatory Jump Balls	57
6. How High Can We Fly	13	6. Crypto Eurodollars and Systemic Risks	58
7. Surviving Winter	15	7. Smart Crypto Banking Integration	59
8. Public Options: Coinbase Opens the Floodgates	16	8. Crypto is Bad for (Bad) Business	60
9. Copy-Trading: WAGMI	17	9. Tax Enforcement vs. Tax Products	61
10. Copy-Trading: We Like the Coins	19	10. Dear Gary Gensler: Are You a Partial Fraud or a Total Fraud	62
2. 10 People to Watch	22	11. Ripple vs. SEC vs. Safe Harbors	67
1. WAGMI	23	12. The Battle for Privacy	69
2. The Big Guys: Samani, CMS, Su Zhu	24	13. Incorporating DAOs	69
3. Emilie Choi, Coinbase	25	14. The American Web3 Council	70
4. Devin Finzer, OpenSea	25	15. Local & Metaverse Battles	72
5. Dan Robinson & Dave White, Paradigm	26	16. There's Nothing More Punk than the Battle for American Crypto	72
6. Jeff Zirlin "The Jiho", Axie Infinity	27	5. Market Infrastructure	74
7. Jay Graber, BlueSky & Tess Rinearson, Twitter	27	1. The Bitcoin Futures ETFs are State-Sponsored Pieces of Sh*t	75
8. Kristin Smith, The Blockchain Association & Katie Haun, a16z	29	2. Goldman Gary and the Reg M Redemption	76
9. Commissioner Hester Peirce, SEC	31	3. Lender Reserves	79
10. Do Kwon, Terraform Labs	32	4. CeFi vs. TradFi	80
11. Honorable Mentions	33	5. CEX Ed	81
3. Top 10 Thoughts on Bitcoin	34	6. Crypto Securities (and ILOs)	82
1. Please Check on Peter Schiff	35	7. Bagholders (and Stakers)	83
2. The King Stay the King: No Flippenings	36	8. Coinlist: A Global Token Issuance Platform (Except in the US and North Korea)	83
3. The Multichain Reserve	38	9. RegTech	85
4. The "Gift" of Bitcoin ETFs	39	10. Payments Innovation	86
5. The Great Fall of China('s Bitcoin Industry)	40	11. The National Security Case for Crypto Dollars	87
6. Bitcoin as Clean Energy Stimulus	42	12. DCEP	88
7. Proof-of-Stake Works Because Proof-of-Work Worked	47	13. Fedcoins & Western CFDCs	89
8. Proof-of-Work & Minority Rights	47	14. USDC & Brother Jeremy	89
9. The Bitcoin Roadmap	48	15. When Paxos Met Novi	90
10. Lightning Strikes El Salvador	49		



6. NFTs & Web 3 Plumbing

1. NFTs: Digital Goods on a Global Ledger 92
2. A \$69 Million Mona Lisa JPEG 94
3. PFPs: Punks vs. Apes 96
4. Fan Tokens 99
5. Axie Infinity & the Play-to-Earn Revolution 101
6. Looted: Composable NFTs 103
7. NFT Financialization 105
8. OpenSea & Friends 106
9. The Cryptoverse 107
10. I Said Metaverse, Not Meta 109
11. Non-Fungible Credentials 110
12. Namespaces & Data Sharing 110
13. DeSo Lotteries 111
14. The Physically Decentralized (Permanent) Web 112
15. Physical Network Scaling 113

7. DeFi 2.0

1. The USDT Bridge 116
2. DAI vs. UST 117
3. The Algorithmic Stablecoins Renaissance 118
4. The Emergence of Non-Pegged Stablecoins 120
5. Worldcoin's Steely Gaze 122
6. Uniswap v3 vs. The World 122
7. Perp vs. dydx 124
8. The Alchemix of DeFinance 124
9. The Fat Applications Thesis 126
10. Tokenized Funds & Index Co-Op 128
11. DeFi's Split Personalities 129
12. The CeDeFi Boom 130
13. Governance Snafus 131
14. Security & The Dark Forest 131
15. Bullish Unlocks & FDV 132

91

8. ETH, Layers, and Bridges

1. ETH's Q3 Earnings Report 135
2. 1559: Miners and MEvers 136
3. The Merge & Liquid Staking 137
4. To EVM or Non-EVM 138
5. Layer 1 Relative Valuations 139
6. Solana Summer Never Ends 139
7. Polkadot's Slow & Steady Rollout 140
8. Cosmos & IBC Opt-In 141
9. Terraforming La Luna 141
10. The Best of the Rest (of the L1s) 142
11. Polygon Flippens ETH 143
12. They're Optimistic 146
13. Zero-Knowledge Scaling 147
14. Build me a Bridge 147
15. Wrapping it All Up 148

115

9. The DAO of DAOs

1. Enabling Tools: Wallets & Staking 150
2. Down the Rabbithole: Learning & Earning 151
3. Working in Web3 152
4. Hierarchies, Pods, and Fluid Organisms 152
5. DAO Treasury Management 154
6. DAO Investor Relations 156
7. Messari: Tying it All Together 158
8. Legal Framework for DAOS 158
9. The New Capital Allocators 159
10. The New Information Curators 160

10. BONUS: Whatever I Want

1. Why You Must Write 162
2. No Sacred Cows 163
3. My Information Diet 163
4. Tips & Productivity Tricks 163
5. Life Advice 164

134

149

161



Top 10 Narratives & Investment Themes

1. The Collapse in Institutional Trust	8
2. Crypto/Web3 is Inevitable	9
3. Bridges and Nifties and DAOs	10
4. Decoupling of Cryptos	11
5. Permanent (Venture) Capital: In, Up and Down, Never Out	12
6. How High Can We Fly	13
7. Surviving Winter	15
8. Public Options: Coinbase Opens the Floodgates	16
9. Copy-Trading: WAGMI	17
10. Copy-Trading: We Like the Coins	19



1. The Collapse in Institutional Trust

Why are you reading this?

Maybe you're among the nearly half of [Millennials and Gen X investors](#) who said it would "take a miracle" to retire. You're worried about [skyrocketing public debt](#), [not-so-transitory inflation](#), and what happens when we finally experience a [hike in interest rates](#). For you, crypto is a life raft.

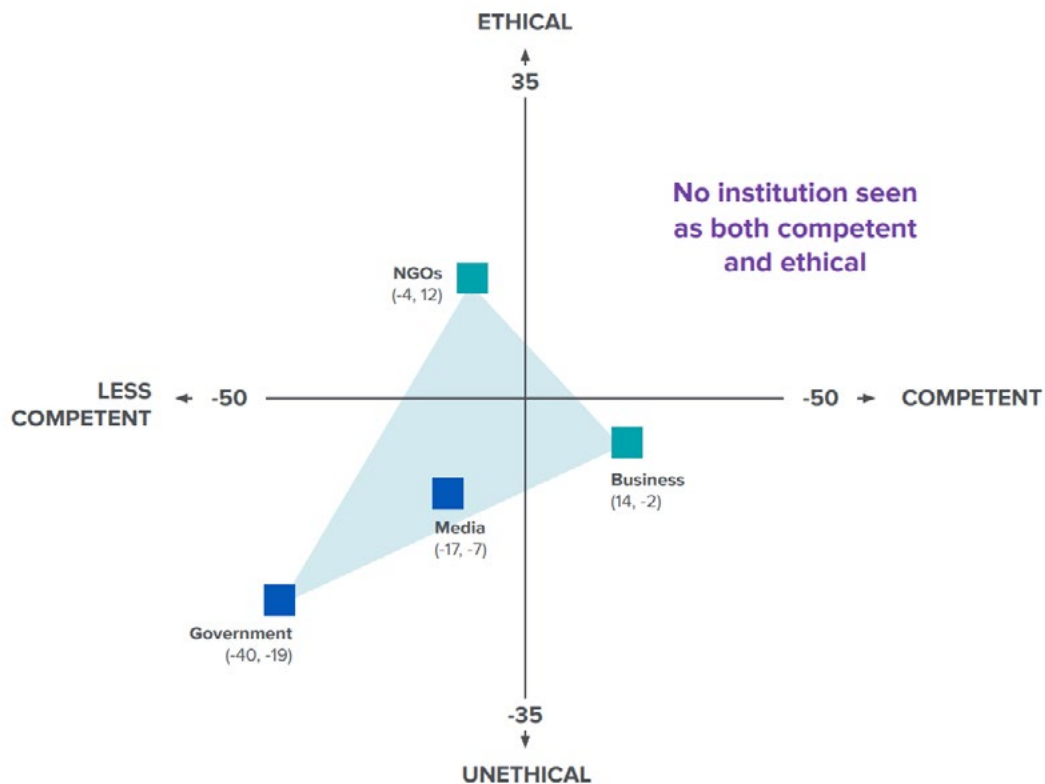
Maybe you're one of the 70% of Americans who [disapprove of Congress](#) and no longer trust policymakers to do the right thing given that they [spend recklessly](#) and [insider trade with impunity](#). You're looking for an alternative to central planners in DC and Beijing. For you, crypto is an exit vote.

Maybe you're a populist - from the right or the left - that seethes knowing Wall Street faced no repercussions for fueling the last financial crisis, and tends to profit from federal policies that punish their customers. Or you're worried about Big Tech's monopoly power, censorship, and control over your personal data. For you, crypto is a shot across their bows.

This graphic probably resonates:

Dimensions of trust

(Competence score, net ethical score)



(Source: [a16z: How to Win the Future](#))



Of course, you could just be into crypto for the fast money, memes, and jpegs. That's cool, too.

Whether you're here as a missionary or a mercenary, you'll find that one of the primary unifying forces behind this movement is the belief that decentralized technologies with embedded financial incentives (a good shorthand for Web3) offer a compelling, often lucrative, alternative to our decaying legacy institutions.

That brings me to my first prediction for 2022: things will get worse before they get better in the "real" world. Inflation will remain above 5% throughout 2022 (70% confidence), while late year interest rate hikes stall the stock market's momentum and hurt growth stocks (60% confidence the S&P dips next year). That will be good for crypto short-term, but risky in the medium-term, as more crypto companies and their users get deplatformed and censorship from western tech and banking platforms accelerates amidst the Biden administration's crypto crackdown.

2. Crypto/Web3 is Inevitable

That's one of the only bearish predictions in this report. Crypto, or the recently en vogue "Web3", is an unstoppable force in the long-term.

Chris Dixon [calls it](#) "the internet owned by the builders and users, orchestrated with tokens." Eshita describes the Web1 -> Web2 -> Web3 evolution as [Read-Only -> Read-Write -> Read-Write-Own](#). Regardless of your preferred shorthand, it might seem intuitive that the *user-owned* economy will outperform the monopolist-owned economy in the long-term.

There's a lot to unpack over the course of this report, but the general theme is consistent: we're going from an internet built on "[rented land](#)" with monopoly overlords, to an infinite frontier of new possibilities. On the frontier, crypto presents a [credible revolution](#) to *all* monopolies, which is why its inevitability scares the incumbents.

We have all the key ingredients we need to succeed.

- **Talent:** Brilliant, passionate, big-visioned young builders are flocking to the open design space of crypto [in record numbers](#), often on their [nights and weekends](#).
- **Capital:** We've seen mammoth venture capital fund raises, crypto startup fundraises, and staggering growth in emerging liquid protocols across Web3 use cases.
- **Timing:** Critical infrastructure was installed during the last bear market that made it easier than ever (socially and practically) to embrace this techno-political movement.

In a [recent post](#) from Eric Peters at One River Capital, he argued that we live in a period of social upheaval, where young people are keen to invest in technologies that disrupt (and potentially bankrupt) older generations' preferred institutions, while pushing investments that benefit themselves at the expense of the old guard. The best part about being young and broke, he says, is that "you have little to lose." That's especially true when younger people view legacy institutions as exploitative.

DeFi offers savers 5% vs. Wall Street's 0.5%. Non-fungible tokens ("NFTs") give creators monetization opportunities without Hollywood's 50%+ rents. Open games and social graphs remove the 100% take rate from tech incumbents and eliminate deplatforming risks.

I have 99% conviction that crypto will be an order of magnitude larger by 2030 because the user economics here are an order of magnitude more attractive. We're at the brink of a total transformation of the global economy. One that's bigger than mobile, and maybe even the internet itself.



Though I waffle on where we are in this *particular* cycle, the tail winds remain strong and the capital markets flush. So my probabilities are split among three scenarios: 1) most likely, we experience a blow off top before the end of Q1 2021, followed by a shallower, but still painful multi-year bear market; 2) we rocket to a \$20 *trillion* bubble that lasts all year, and sits on par with the dotcom boom in real dollars - unlikely, but possible given accommodative monetary policies worldwide, neverending government spending, and crypto's accelerating narrative momentum; 3) we march slowly and steadily higher into perpetuity (the "supercycle" thesis).

Ironically, the most bearish case here (Q1 blow-off top) may be the most bullish long-term and vice versa. "Hyperbitcoinization" and crypto's permanent ascendance at this stage of our development would only happen against a very dystopian backdrop indeed.

3. Bridges and Nifties and DAOs

"Web3" is a good all-encompassing term that captures cryptocurrencies (digital gold & stablecoins), smart contract computing (Layer 1-2 platforms), decentralized hardware infrastructure (video, storage, sensors, etc), Non-Fungible Tokens (digital ID & property rights), DeFi (financial services to swap and collateralize web3 assets), the Metaverse (the digital commons built in game-like environments), and community governance (DAOs, or decentralized autonomous organizations).

I expect growth everywhere across Web3, though three areas are particularly underdeveloped: NFT infrastructure, DAO tooling, and inter-protocol bridges.

We're witnessing a Cambrian explosion of innovation within the NFT space that is just getting started. I'm not sure how much longer the market for *individual* NFTs can bubble up, but I do know that reliable and ubiquitous NFT *tooling* is still largely missing. Marketplaces, financialization primitives, creator tools, community-oriented business models, and decentralized identity management / reputation management systems are all in their infancy. That core infrastructure will be one of the hottest areas of investment in 2022.

Same goes for DAO tooling, which is an existential need right now across crypto communities, where voter apathy is reaching crisis levels and investments are taking far too long to process. If you take the 10 year view that open, token-governed marketplaces will replace companies (as I do); and recognize that their communities will need 100x improvements in collaboration tools in order to operate more efficiently than centralized competitors; and understand that every DAO treasury transaction is essentially subject to a board-level proxy vote today; then you can appreciate why 2022 will be the year of DAO tools. (I've bet on it both with my personal portfolio, and via Messari's bet-the-company move to build an operating system for Web3 participation.)

Last but not least, we have the core crypto plumbing: scaling and interoperability solutions. Ethereum's blockchain hit its capacity this year. Other Layer 1 platforms have exploded 50-100x in value as investors bet on crypto development to parallelize across new ecosystems and absorb the excess demand. All of these new blockchains (plus Ethereum's Layer 2 rollups) will need to talk to each other, so the most acute pain point in crypto today may be the lack of bridges. If the future is multi-chain, then those who build better cross-chain connectors and help move assets fluidly across parachains, zones, and rollups will inherit the (virtual) earth.

If these all sound like foreign concepts, that's ok. NFTs (Chapter 6), DAOs (Chapter 9), and Layer 1 Interoperability (Chapter 8) make up a third of this year's report for a reason.



4. The Decoupling of Cryptos

Different crypto sectors have different value drivers. We've gone from "everything is a cryptocurrency" to "actually, there's currencies, [fat protocols](#), DeFi apps, distributed computing platforms, NFTs, work-to-earn markets..."

Discerning investors increasingly look at the actual usage and underlying microeconomics of various networks and trade around their unique growth drivers. It's still a meme-driven market, but many of the memes are reflecting - dare I say - fundamentals? Ari Paul [wrote one of the most insightful threads](#) on the recent decoupling of crypto markets:

"This is the cycle where crypto use cases unrelated to bitcoin's were finally validated and achieved meaningful adoption...In previous cycles it made little sense to be a sector specialist in crypto. Defi and NFTs were basically nonexistent 4 years ago. Most other "sectors" didn't meaningfully exist as such. "Decentralized file storage", "smart contract platforms", "privacy" and other "sectors" by which crypto coins were often segmented were arbitrary and arguably nonsensical...Now, being a defi yield farmer or NFT speculator, is arguably a full time job, and you need, or will soon need, a small team just to keep up with one of those segments."

That's an important development, and it's where private investment funds will have such a huge ongoing competitive advantage vs. their generalist competitors. There are massive information asymmetries in protocol "reporting" standards, a steep technical learning curve, and limited risk management infrastructure (how do incumbents get compliance, legal, and accounting comfortable with some of these new structures) that keep barriers to crypto investing high.

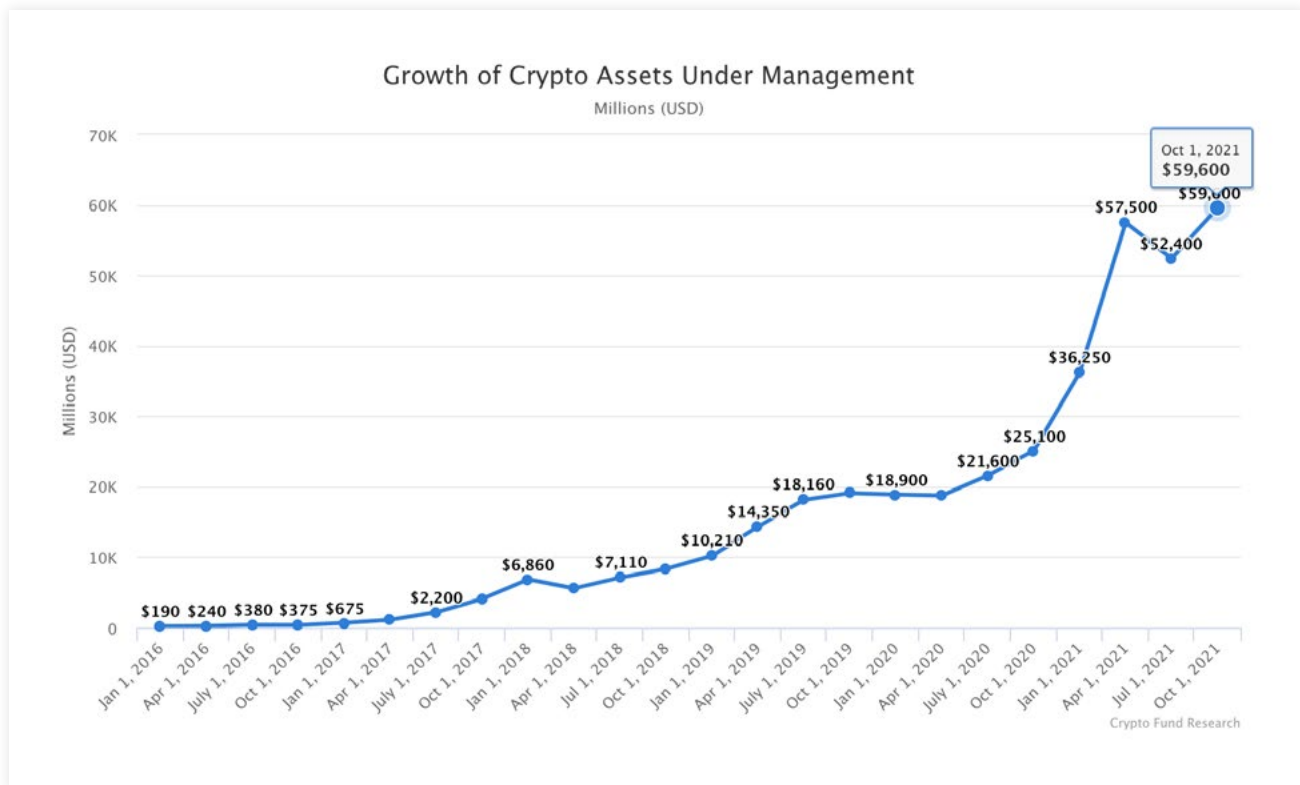
Crypto funds are having the times of their lives right now. A dynamic that will likely continue well into the new year.



5. Permanent (Venture) Capital: In, Up, & Down, Never Out

The amount of capital that has flooded into crypto this year is mind-boggling.

The dedicated crypto funds have seen record new capital raises *and* record AUM from the appreciation of their core holdings. Some of the funds (looking at you, Multicoïn) are likely among the best performing investment firms *of all time*, which makes it easy to see why the group has had no trouble continuing to rake in cash.



(Source: [Crypto Fund Research](#))

It's tough to comprehend the size of the private crypto fund market right now. When we raised \$25mm for DCG in 2015 it was one of the biggest rounds in a crypto investment firm at the time. Today, firms like Polychain, Paradigm, a16z, Multicoïn, 3AC and others are each managing *billions* of dollars (in some cases, \$10 billion+) or more, and investing \$25mm a clip in their medium-sized deals. Hedge funds plan to deploy [7% of their assets into crypto within 5 years](#), and pensions are starting to [buy direct](#), too!

Large capital allocators are continuing to move up the risk curve amidst a negative interest rate backdrop, and most simply cannot afford to ignore crypto anymore.

Crypto's \$3 trillion of liquid value creation in 10 years now rivals that of all [other venture-backed startups combined](#). Institutional entrants have taken note, and it's likely they'll deploy capital in a way that could ensure we avoid crashes of similar depth and length to 2014-2015 and 2018-2019. When newcomers enter the space, that money tends to flow in two directions - in and down. Not out. Capital may trickle down to higher beta, emerging tokens, but when it cycles back up, it often [doesn't cycle out](#) (except for taxes). Instead, it stops at BTC or ETH or SOL or the crypto "blue chips".



If you'd prefer to stay away from direct exposure to tokens, that's ok. The need for token infrastructure has created a boom in [crypto unicorns](#), which offers hedged exposure to the underlying asset class.

According to [Dove Metrics](#), we saw \$8 billion of private investments across 423 deals in Q3, nearly half of the \$17.8 billion invested since the start of the year, which was already more than the previous six years *combined*. Nearly 90% of the largest deals in crypto's history have happened this year, and that's *excluding* the Coinbase direct listing. About 75% of the funding was deployed into infrastructure and centralized services, and that was *before* the FTX and DCG announcements and potentially imminent [Binance funding announcement](#).

The institutions are actually here this time.

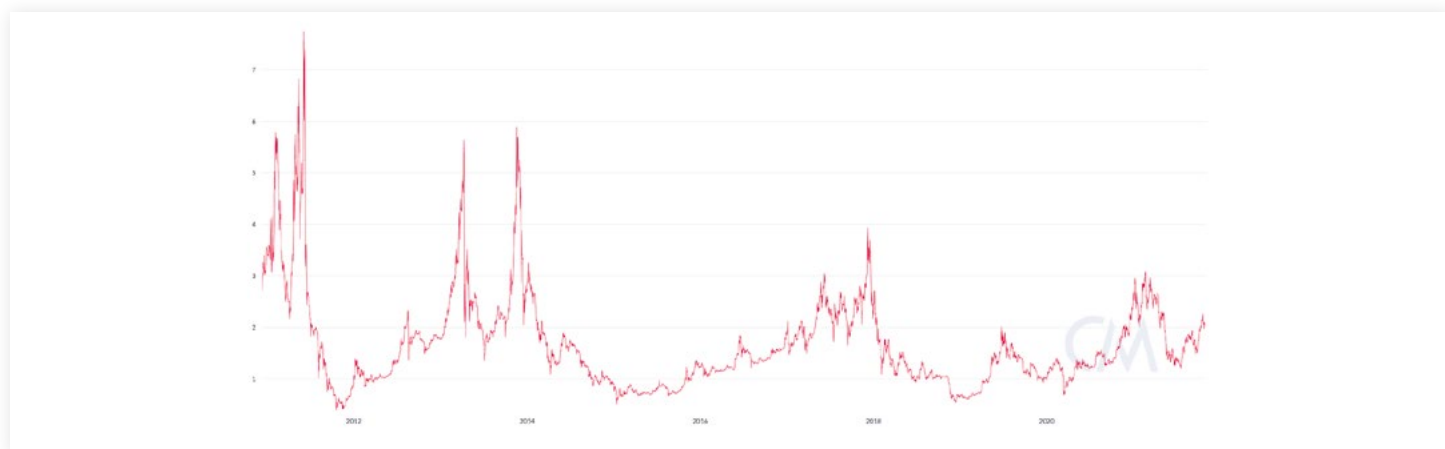
6. How High Can We Fly

The crash, [which we all know is coming](#), might be more muted than those of prior cycles, but how about the remaining upside? Even with the tailwinds we just discussed, doesn't it just *feel* a little topy? The \$30 billion Shiba Inu market caps, the [Times Square NFT billboards](#)?

I'll tell you which top signals I'm looking for, starting with bitcoin.

1) **Bitcoin**: The king has no real rival. (I'll elaborate on why in Chapter 3.) As a monetary asset with no earnings, it's an asset that is priced vs. valued, which means it's almost always judged on a relative basis to its analog cousin, gold. But there are "fundamentals" worth tracking for bitcoin, too! The best bogey may be the [market value to realized value](#) metric popularized by Coin Metrics. That's the ratio of "free float" bitcoin market cap (coins that have moved in the past five years) to "realized value" which sums the market price of each bitcoin according to the time it last moved on-chain. Market cap can stay the same while realized market cap spikes and vice versa. One is a snapshot of bitcoin stock times price. The other is a dynamic measure that brings flow into the equation as well.

If you aren't a HODLer, and can't stomach four year bear markets, then whenever MVRV hits 3 tends to be a good time to take gains. (Sell a kidney or a newborn to buy when MVRV falls below 1.) In the three previous "double bubbles" - which you can really only see using a metric like MVRV since previous "bubbles" barely register on a price chart - the amount of time spent above 3 has gotten progressively shorter. In 2011, MVRV stayed above 3 for four months. In 2013, it was there for ten weeks. In 2017, three weeks. Earlier this year, it was three days.



Source: [Coin Metrics](#)



If history were to repeat itself, what's that mean in dollar terms? Hitting a MVRV of 3 again this year would take us to the \$100,000-125,000 range. Not bad!

If things went completely bonkers beyond that, the next target for bitcoin would be the gold market cap. At today's prices, parity with gold would bring us a \$500,000 bitcoin. So there may still be a 10x investment opportunity there, but even that moon case offers a relatively low ceiling compared to bitcoin's historical returns. (Unless, of course, the ceiling completely disappears, which means fiat currencies have failed and we've defaulted to pricing things in bitcoin. 1 BTC = 1 BTC)

2) Ethereum: There's been a lot of "flippening" talk from ETH mega-bulls recently. Could ETH overtake BTC this cycle? Unlikely. Not with Ethereum's persistent scaling challenges, its Layer 1 competitors, and the willingness of infrastructure companies and application builders alike to embrace the likelihood of a multi-chain future. I continue to think it's more interesting to consider whether Layer 1 platforms *collectively* flippen bitcoin in much the same way that the FAMGA market caps have overtaken M1 (h/t Arthur Hayes [for the analogy](#)).

How about more generally speaking? Could ETH overtake Microsoft, Apple, or Google? That would be a 3-5x from here. Could it eclipse all five combined? That would be a 15-20x, which feels like a tall order even if ETH at 5% of FAMGA market cap feels cheap.

3) Solana et al: The new "it girl" of crypto is gunning for the #3 spot in crypto market cap (\$60 billion). But then again, so is Polkadot (\$40 billion), and Avalanche (\$30 billion). If the thesis for these alternative Layer 1 protocols is that they are higher beta plays than ETH that will eat into Ethereum's market share dominance, then you're forced to ask, "what about Terra (\$16 billion), Polygon (\$12 billion), Algorand (\$11 billion), or Cosmos (\$7 billion)? The relative value trades all come down to business development wins (app distribution) and recruiting wins (can you attract developers to build on non-Ethereum blockchains). The "Ethereum killers" all have the money to compete aggressively, but as an investor your choices are to either pick winners, or buy the basket (short Ethereum Layer 1 dominance). Either way, these assets tether to ETH.

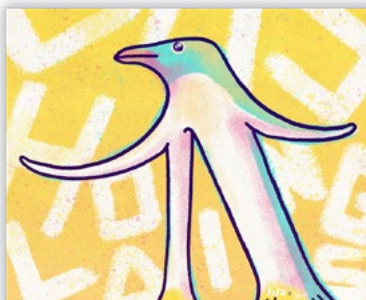
4) DeFi: Long DeFi, short the bankers, amirite!? Despite DeFi's monstrous 2020 run, DeFi trades at [less than 1% of the global banks' market cap](#), which shows how much upside remains long term. Prices have stalled for some of the top DeFi protocols, but if you have conviction that crypto capital markets will displace centralized institutions at an accelerating clip, it may offer better risk-reward opportunities than elsewhere in the market today. That said, inter-protocol competition is fierce, regulatory scrutiny is coming, technical vulnerabilities are pervasive, systemic defaults could cripple the entire market, and high gas fees are crippling the unit economics. By many metrics (price-to-sales and [price-to-earnings](#)), DeFi remains compelling, but the math only works for whales right now.

5) NFTs: Given the fact that they're...non-fungible and illiquid, it can be difficult to ascribe any sort of reliable "market cap" to the NFT sector. DappRadar estimated NFT market cap of [\\$14 billion in early September](#), a number that has risen since. Given the design space that NFTs have opened up for the entire crypto user economy, the long-term size and scope of this segment is scary big. Meltem points to [LVMH](#) (\$375B?), while Su Zhu thinks we'll see [10% of crypto](#) (\$225B today) in NFT market cap. I don't think they are off, but that may speak more to the opportunity for NFT creators and infrastructure builders than it does to the investability of most specific NFT projects. (See Chapter 6.)



7. Surviving Winter

If you couldn't tell by now, we like the coins. We like them for the long-term and the short-term, but it's the medium-term that can get ya. "From what height do we crash?" sounds like a nice problem to have, but until you've lived through a crypto winter, you don't actually get it.



"Every Bear Must Die"

-CMS HOLDINGS

Many will lose faith and won't be able to stomach the soul crushing multi-year grind lower than that is a crypto winter. "Wow, the government might actually regulate this out of existence," "It's just too early for these products," and, of course, "I told you this was a bubble" will be among the drumbeat of negativity you can expect to hear parroted by critics. In addition to eating big paper (or real) losses, you'll see people have breakdowns, go bankrupt due to overleverage (or poor tax planning), quit otherwise promising projects, turn nasty, depressed, or apathetic, and generally lose sight of the longer term potential of crypto. To make matters worse, the next bear market will be a regulatory nightmare, and we won't have the bull market vibes to help defend ourselves against all of the consumer protection, fraud and abuse, systemic risk, ESG, and illicit activity FUD that our enemies will throw at us. At the same time, the "grassroots" crypto herd will thin because it's tougher to wage war when you've lost 90% of your savings and need to go find a real job again.

Sounds harsh. Is harsh. But maybe it won't be *quite* so bad this time.

The first order of business post-crash will be to go back to sections #1-6 and determine if you still believe those theses are true. Is the centralized world still crumbling (1), does web3 offer an optimistic bet on the future (2), are the building blocks of the new frontier (Bridges, DAOs, NFTs) still worthy of large investments during the next installation phase (3), will it be easier to find fundamentally strong projects in the next down cycle (4), is there still abundant capital available to fund everything interesting (5), and do you still believe the high-water marks are attainable in a 5-10 year timespan (6)?

If you remain confident, put on a helmet, embrace the cold, and take heed of these winter survival tips: unwind leverage early, cash out tax obligations when incurred, but for the love of god, do not try to time "the top".

On leverage: this should be self-explanatory: if you are not a professional trader, your leverage is merely a cash transfer to those who are. Crypto is volatile enough, with plenty of remaining upside. You don't need to push your luck here, and blow up your entire personal balance sheet.

On taxes: most people understand that they shouldn't rack up credit card debt to purchase doggie coins, but will also totally overlook the "leverage" they take on by not planning - in December - to sell what they must to cover tax liabilities. If you started January 1, 2021 with \$10,000, it swells to an actively traded \$100k by December 31, and then tanks to \$25,000 Jan 1, 2022, you owe the government more money than you have. Thanks for playing.

On shorts: please do not short. Even if you're right, you'll likely fail to time the top and blow yourself up. When you lose, everyone will celebrate your demise and dance on your grave while they are getting rich. It will make you sad. Even if you win, no one will like you, and you'll lose long-term. I don't make the rules. Just here to help.



And one more thing for the falling knife catchers, who think “wow, this will be great. I can’t wait to buy discounted coins in the next bear market.” Crypto can always go lower than you think, for longer than you think, and it will. Crypto meme trading and reflexivity are a helluva drug. When the music stops, you’ll see the painful withdrawal, and it takes some time to detox.

If you’re a young team managing a token treasury or balance sheet for the first time, do what you can to protect yourself and your team from the nuclear fallout of a crash. A lot of teams are being idiots with their treasuries, and setting themselves up to fail in their most important job as capital stewards: “don’t f*ck up the money.” ([Here are Messari’s safety recommendations.](#))

If you’re an aspiring Web3 employee, it’s never a bad idea to work on building indispensable products at foundational companies with big warchests.

The get rich quick crowd will evaporate, but the next cycle’s unicorns will get built during the doldrums of winter. It’s amazing how much success in crypto comes down to staying power. “We’re all gonna make it” is a fun bull market meme, but it’s much more important to be able to scream “we’ll survive!” when everyone is laughing at you, the market is down 80%, competitors are going bankrupt, and the customers are cold. Ask recruiters about their company’s runway and **cash** on hand before you sign. (Most should be pretty well off at this point.)

The time to go all in with crypto on your balance sheet was last year. I’d be more cautious here: 10 year and 10 hour thinking only.

8. Public Options: Coinbase Opens the Floodgates

Will coins outperform the companies that support them?

As impressive as Coinbase’s rise to \$70 billion has been, it has barely kept pace with bitcoin as an investment since the company’s Series B in 2013. They’re not alone. Other crypto infrastructure “blue chips” have also struggled to keep pace with the underlying public assets. In bitcoin terms, decacorn investment firm Digital Currency Group is a [veritable crypto capital incinerating machine](#), down ~80% in BTC terms since 2015. The numbers get even uglier if you compare companies to Layer 1 tokens like ETH.

On the other hand, Binance’s BNB tokens appreciated to historic heights within four years, in large part because BNB incentivized new users to sign up for the exchange platform in return for a proxy claim on ~20% of Binance’s earnings power*. BNB sits at \$90 billion+ in market cap, while the broader company is worth 3-4 times that.

Crypto IPOs and ETFs may be more important for attracting institutions and strengthening crypto’s mainstream narrative than they are for helping retail investors access the returns of the space. Coinbase could be a [trillion dollar company](#). The BITO ETF was the fastest ever ETF to amass \$1 billion in investor capital. Nice. But those public stocks are like crypto’s college diplomas. They may matter to your parents, but not so much to your friends, who can access better crypto-native vehicles (including tokenized exchanges and indices) instead.

The best part about the new public stocks (COIN and BITO) is the free marketing and insights crypto natives get from their filings. With Coinbase, you can track their non-trading lines to get a good sense for which hosted services are up-and-coming. [SBF likes the free intel](#), too. With BITO and the futures ETFs, we get top tier PR collateral with which we can relentlessly slap SEC Chair Gary Gensler in the face and expose him as a fraud.* So there are some benefits to having public stonks, in addition to tokens.

(*Oooh baby, I’m just getting warmed up. Read Chapter 4 for more about [Goldman Gary](#), and Chapter 5 for more on these unconscionable ETF products.)



9. Copy-Trading: WAGMI

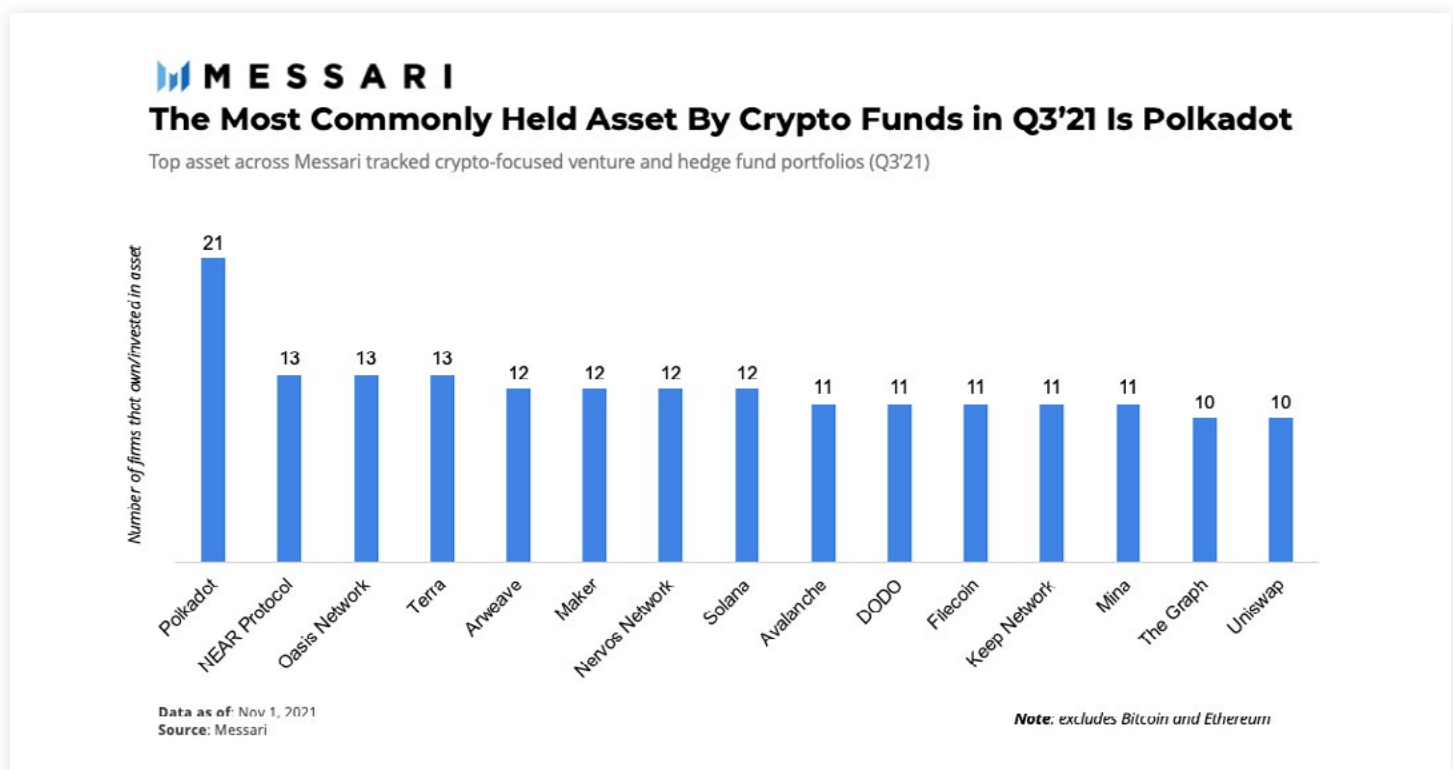
Sometimes, you have to not overthink things.

Crypto trading tends to be social and memetic. Just look at how quickly retail traders “ape” into new projects backed by some of the industry’s most successful investors. Capital is also highly fluid - billions of dollars have been made this year pursuing the “hot ball of money” trades, i.e. chasing momentum as it shifts from sector to sector, asset to asset, and meme to meme.

The [role of venture in crypto is changing](#), and it rewards builders and fast followers. Because the markets are inefficient and reflexive, it makes sense to press winners, and offload losers. As SOL rallied, more investment flooded into its ecosystem, the asset earned more comparisons to ETH, new applications attracted more buzz, and the virtuous cycle continued. This is what the top traders fuel, even if skeptics think these patterns resemble [ponzis](#).

There are rhythms to the crypto market as well. If BTC leads, then alt season is probably right around the corner. Because people now believe this to be true (and because it makes intuitive sense to diversify down the stack), the rotation even happens more quickly and reliably these days. There’s literally a [path to altseason](#) guide, and some would argue that trading narrative momentum in crypto really is as simple as “strong BTC, stronger ETH, strongest smallcaps.”

You can listen to FTX as they explain how to trade [the everything bubble](#), or read some of the more prolific investors [update their theses in real-time on twitter](#). Or you can look at the top 20 funds and compare and contrast what they hold and crowdsource your portfolio.



(Source: [Messari Pro Q3 Fund Analysis](#))



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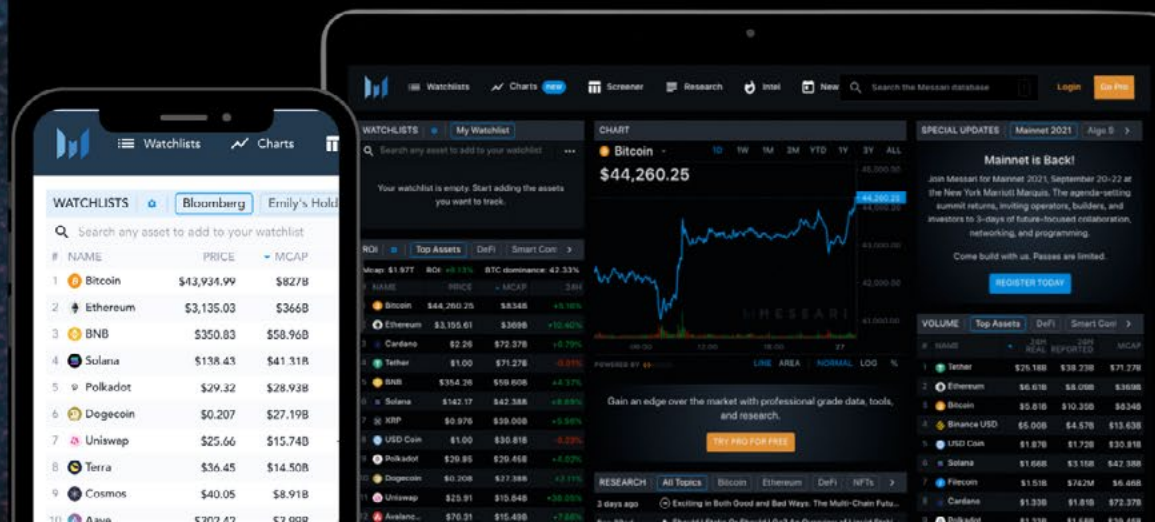
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10. Copy-Trading: We Like the Coins (Disclosures, Not Financial Advice)

Our analyst team discloses their holdings on a monthly basis. The team is getting bigger, so this section is getting longer, but all analysts below have outlined: 1) their current 5%+ portfolio holdings, 2) top picks from 2021 and how they've performed (if applicable), and 3) their highest conviction ideas for 2022.

This is not financial advice, so don't sue us for trying to be transparent about potential conflicts. Also, don't take portfolio advice from a two-bit idiot. Past performance is not indicative of future results, yada, yada, yada...

TBI

Biggest winner: LUNA +5,746% | **Biggest loser:** ANT +52%

Holds: BTC, ETH, LUNA, PERP, RUNE, ZEC, TRIBE/FEI*, OpenSea*

**Illiquid holdings that were marked up significantly in my angel portfolio*

Likes: Whatever the team likes

Aidan

Biggest winner: AXS (hard to beat a YTD return of +23,621%) | **Biggest loser:** YAX -80% (Aidan picked the biggest winner and the biggest loser on the team)

Holds: AXS, BTC, ETH, RUNE, FTM, RGT, MKR, YFI, ANY, MLN, renZEC

Likes: Revenue generating protocols (DeFi 1.0 Renaissance (Have a ceiling in a Bull market but a floor in a Bear). ATOM. Bearish monolithic smart contract platforms. RON > SLP hard to bet against Sky Mavis but hard to see SLP enduring once Ronin LM rewards dry up.

Chase

Holds: ETH, SOL, ALCX, HNT, OHM, TOKE, OCEAN, RUNE

Likes: Ethereum for decentralization, Solana for Proof of History, TradFi (high frequency data and CLOB), marginal user onboarding, and SBF, infrastructural protocols (wireless, liquidity, data, etc), liquidation-free borrowing, giga-brain DeFi developers

Dustin

Holds: ETH, SOL, RGT, AURY,

Likes: Modular ecosystems + Eth scaling solutions (bearish the monolith). Like metaverse infrastructure (RON an example) but the current games are dog shit. Like decentralized cloud compute (RNDR, AKT, etc). Likes on-chain cashflows (superfluid - leads to under-collateralized lending)

Eric

Biggest winner: RUNE +739% (only one without a comma, NGMI)

Biggest loser: CVP -22%

Holds: BTC, ETH

Likes: Anything enabling multi-chain and L2 applications but bearish on valuations of most "ETH killers"

Eshita

Holds: ETH, SOL, BTC

Likes: the shift from applications to infrastructure for web3, NFTs (data storage, DeFi use-cases, gaming + music), DAO tooling, BTC <3

Jack

Biggest winner: HNT +3,046%

Biggest loser:

Jack is on BD now so we aren't including him this year but he deserves the credit on HNT



Jerry

Holds: BTC, ETH, SOL, OHM, CAKE

Likes: The re-emergence of Ethereum post-merge and shift back from alternative L1s, staking protocols, more TradFi integration with DeFi (off-chain collateral, ways to avoid needing to overcollateralize, tokenizing of real-world assets, etc.) which brings organic adoption back to DeFi in 2022, web3 infrastructure, GameFi aggregators, and metaverse infrastructure

Maartje

Holds: BTC, ETH, CRV

Likes: ETH, media and entertainment as a broad category because of mass adoption potential, the intersection of DeFi and TradFi, DAO tooling, Crypto.com, Special Purpose DAOs (SPDs will be a thing)

Mason

Biggest winner: Another smart AXS pick at +23,621%

Biggest loser: ANT +52% (DAOs so hot right now, DAO infra so not)

Holds: BTC, ETH, ATOM, HNT, INDEX

Likes: Modularity, NFT platforms (RARI, RARE), MVI, Web3 infra (i.e. AR, GRT, AKT, LPT), POOL, creator monetization (e.g. Mirror), NFT<>DeFi (e.g. NFTX, Fractional.art), Cosmos Hubs (ATOM, OSMO), Data availability layers (Ceramic, Celestia), ZK Rollups, Coinbase and USDC, Metaverse Infrastructure, Governance Tooling, and loyalty points exchanges.

Dislikes: Massive Bull Market Valuations, [Thin Mint Girl Scout Cookies](#)

Tomas

Holds: BTC, ETH, RUNE, LUNA

Likes: Multichain projects, metaverse and gaming (financialization of fun with P2E), ETH scaling solutions (ZK tech particularly), DeFi blue chips (finger crossed for 2022), cash-generating tokens, liquid staking, and solid dev teams

Watkins

Biggest winner: LUNA +5,746%

Biggest loser: CREAM -39%

Holds: ETH, LUNA, SOL, SYN, HNT, AR

Likes: Cash (I know it's a melting ice cube). But otherwise Multichain Infrastructure (Long Modularity), Web 3 Infrastructure (The Web 3 before "Web 3"), ZK tech (all the smart kids are talking about it), Cosmos Ecosystem (finally time?), decentralized stablecoin protocols (practically a permabull), and DAO infrastructure (hard to play but massive trend). Finally I'm cautiously optimistic DeFi and think it makes a comeback in 2022 (wait DeFi 1.0 is not dead? 🌍👷🔫👷)

Wilson

Biggest winner: HNT +3,046%

Biggest loser: BTC +92%

Holds: HNT, ETH, ATOM, OSMO, DOT, ACA/KAR, and some [SOL-LUNA-AVAX](#)

Likes: Modular L1s that enable customizable execution layers (with Solana as the most viable hedge), multichain infrastructure and tooling - the unsung heroes of the modular thesis (storage like Arweave, shared security and data availability like Celestia, indexer and data query protocols like The Graph and Covalent, computing marketplaces like Akash), liquid staking protocol so you can have your cake and rehypothecate it too (Lido, Rocket Pool, Acala, Umee), and DeFi hubs and the rise of new hubs within the Cosmos ecosystem (Osmosis, Terra, Umee). Also, Zero-Knowledge tech and its iterations like ZK rollups will revolutionize the scalability and UX of crypto economies. StarkWare and ZKSync rightfully steal the show, but keep an eye on projects like Aleo that can unlock new types of crypto-enabled applications.

Our research team has grown so we can't list everyone this year but our holdings are updated monthly on [this page](#).



Messari Research 2021 Picks

10 columns, 1 filter
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#	ASSET	PRICE (USD)	REPORTED MARKETCAP	REAL VOLUME (24H)	CHANGE VS USD (30D)	CHANGE VS USD (90D)	CHANGE VS USD (1Y)	CHANGE VS USD (YTD)	SECTOR
1	Axie Infinity · AXS	\$140.60	\$8.64B	\$300M	+7.88%	+104.07%	+29619.43%	+23819.41%	Gaming
2	Terra · LUNA	\$37.91	\$15.30B	\$329M	-9.43%	+43.87%	+9291.22%	+5879.67%	Smart Contract Platforms
3	Hellum · HNT	\$42.62	\$4.37B	\$28.15M	+97.38%	+105.22%	+2504.65%	+3017.51%	IoT
4	Rocket Pool · RPL	\$47.25	\$486M	\$2.03M	+32.72%	+172.25%	+1244.83%	+2068.35%	Derivatives
5	Chiliz · CHZ	\$0.457	\$2.73B	\$252M	+31.69%	+23.89%	+3443.33%	+2033.16%	Misc
6	Audius · AUDIO	\$2.47	\$1.26B	\$191M	+6.12%	+4.17%	+1931.09%	+1483.66%	Content Creation and Distribution
7	Perpetual Protocol · PERP	\$14.38	\$994M	\$15.32M	-11.62%	-13.51%	+1189.02%	+1140.22%	Derivatives
8	Rarible · RARI	\$19.96	\$106M	\$1.21M	+0.61%	-38.61%	+837.93%	+891.15%	Tokenization
9	THORChain · RUNE	\$10.80	\$2.80B	\$91.58M	-21.46%	+14.42%	+1082.18%	+742.15%	Decentralized Exchanges
10	Ethereum · ETH	\$4,213.00	\$501B	\$5.04B	+0.45%	+37.02%	+600.50%	+480.18%	Smart Contract Platforms
11	Siacoin · SC	\$0.0192	\$949M	\$32.55M	+1.51%	-8.20%	+392.74%	+465.92%	File Storage
12	Kusama · KSM	\$324.90	\$2.78B	\$38.14M	-18.26%	+18.54%	+581.70%	+371.32%	Smart Contract Platforms
13	Polkadot · DOT	\$38.59	\$38.37B	\$541M	-12.43%	+63.03%	+580.28%	+370.15%	Smart Contract Platforms
14	Zcash · ZEC	\$254.40	\$3.37B	\$671M	+55.93%	+84.25%	+205.81%	+367.50%	Currencies
15	Uniswap · UNI	\$20.85	\$13.16B	\$83.63M	-21.40%	-17.63%	+415.26%	+342.96%	Decentralized Exchanges
16	Alpha Finance · ALPHA	\$0.873	\$391M	\$8.79M	-12.18%	-13.58%	+241.20%	+324.68%	Asset Management
17	Enzyme Finance · MLN	\$104.00	\$187M	\$2.84M	-25.73%	-17.41%	+237.90%	+298.02%	Asset Management
18	Wrapped Nexus Mutual · WNXM	\$81.61	\$137M	\$2.92M	+35.00%	+20.06%	+218.69%	+243.95%	Misc
Total: 28 assets		-	\$1.67T	\$13.14B	-6.55%	+27.24%	+577.73%	+408.10%	-

You can see the full portfolio from last year on [this screener](#).



10 People to Watch

1. WAGMI	23
2. The Big Guys: Samani, CMS, Su Zhu	24
3. Emilie Choi, Coinbase	25
4. Devin Finzer, OpenSea	25
5. Dan Robinson & Dave White, Paradigm	26
6. Jeff Zirlin “The Jiho”, Axie Infinity	27
7. Jay Graber, BlueSky & Tess Rinearson, Twitter	27
8. Kristin Smith, The Blockchain Association & Katie Haun, a16z	29
9. Commissioner Hester Peirce, SEC	31
10. Do Kwon, Terraform Labs	32
11. Honorable Mentions	33



1. WAGMI

In the past, I've avoided the urge to give "everyone" a spot on this list, because it felt like a cop out, and the sign of a market top. What's *different this time*TM is the emphasis we're beginning to see on learning, earning, and contributing as a path to riches vs. mere passive speculation.

"We're all going to make it" is my favorite crypto meme in years. It says "we're still early" without coming across like an obnoxious, early MLM punter. It's a memeable twist on the famous Balaji quip, "[win and help win](#)", which is a personal favorite. And it embodies more mission alignment and altruism than another crypto twitter favorite "Up Only." WAGMI embodies crypto's cultural transformation from the "down with the government, let's move to a citadel" crowd to the "let's fix the future with better tech, aligned incentives, and other builders" crowd.

WAGMI includes you, assuming you're reading this report with an open mind. Welcome!

And if you are still skeptical of crypto, no sweat. Just don't be openly hostile *and* closed-minded to its potential. Bad faith critics like Jamie Dimon are NGMI.

[Seriously, though, Dimon's thoughts on crypto over the years have been...consistent, and consistently wrong. He's called it a "terrible store of value" (2014), said it "will not survive" and "will be stopped" (2015), is "going nowhere" (2016) and is "a fraud" (2017), told interviewers "I don't really give a shit" about crypto (2018), then launched JPMCoin pilots (2019), admitted it's "not my cup of tea" (2020), and then tripled down on his dismissiveness this fall by saying "I have no interest in it" that it's "fool's gold" and "worthless." Don't be like Jamie. He's NGMI.]



(I right click saved this from twitter. It isn't mine. But I'd like to cite properly if you can find it.)



2. The Big Guys: Samani, CMS, Su Zhu

Big year for the big guys.

Yes, a lot of amazing tech has been built, and yes, there are amazing founders who deserve high praise (they are covered elsewhere in this section and broader report), but let's be honest, it was, above all, a banner year for whales. Specifically the big investors who pulled through the 2018 bear market intact, and lived to realize some of the biggest wins of 2021.

Kyle Samani's Multicoin Capital had a historic year - by crypto standards and venture capital standards, period - with multiple billion dollar winning bets across a variety of crypto segments. The Graph, Helium, Arweave, Solana all reached billion dollar network status this year, and the rumor is Multicoin eclipsed \$10 billion in AUM in the process. Retail investors follow crypto's hot hands, and no one has been more on the mark with moonshot seed investments than Multicoin. They "talk their book" via their [public investment memos](#), but I've learned a lot from them, even when I've been on the [wrong side of the thesis](#) (f*cking zcash).

On the other side of the world, another giant looms, Su Zhu's Three Arrows Capital has amassed one of the largest funds in Asia, and boasts one of the top performing portfolios in their own right. They were also one of the biggest bettors on the [Grayscale Trust trade](#) in 2020, clipping double digit premiums to net asset value for most of the year at massive scale. Their stakes in Solana, Avalanche, and Polkadot have skyrocketed, and Su Zhu's got no problem [changing allegiances](#), calling it like he sees it, and kicking the hornet's nest.

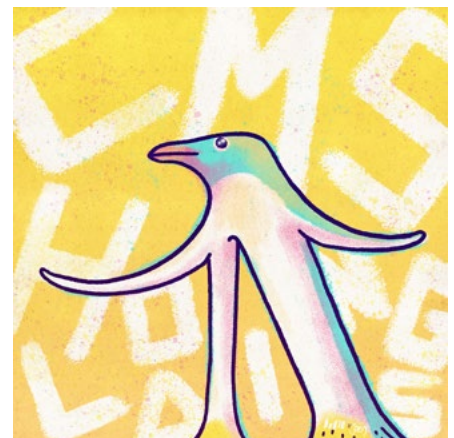
Then there's CMS Holdings. Nobody in crypto has more fun than the penguins, and they tend to go big with...everything. CMS popularized the "[hot ball of money](#)" meme in the beginning of the year. He sent [\\$5,000 worth of Girl Scout Cookies](#) to one of our analysts. He relentlessly mocks bears and paper-handed traders. He [bought a 7" cube](#). He [pays people to take twitter shittalking to live debates](#). Rumor has it, he even [bid on a dinosaur](#). (If true, that may have been his only missed trade of the year.) CMS and team may also be the fastest traders / and most responsive investors in crypto, a nice byproduct of not having to manage other people's money. May you all have as much fun in the new year as CMS has every day.



Kyle Samani:
[View this NFT on OpenSea](#)



Su Zhu:
[View this NFT on OpenSea](#)



CMS Holdings:
[View this NFT on OpenSea](#)



3. Emilie Choi, Coinbase



Emilie Choi:
[View this NFT on OpenSea](#)

One of the things I find most remarkable about Coinbase is how resilient they have been amidst the near full turnover of their leadership team in recent years. Aside from Brian Armstrong, nearly no one from the early days is left on staff. Fred Ehrsam remains on the board, but his attention is on scaling venture fund, Paradigm. Many other employees in the “Coinbase Mafia” have gone on to start new companies or venture funds.

I would argue the two people outside of Brian who have been most responsible for the company’s ongoing success have been former CTO Balaji Srinivasan (who, despite his short one year tenure helped steer the company in the right, multi-asset strategic direction, as 50% of Coinbase revenue now comes from trading pairs beyond BTC and ETH) and Emilie Choi, whose BD / M&A chops quickly catapulted her into the President & COO role at the company.

The backstory behind Coinbase Ventures is [pretty remarkable](#): no full-time employees, born a day after Emilie brought the idea to Armstrong, now one of the most active investors in crypto, etc. But it’s the large scale corporate M&A the company has done that’s been even more impressive. The company’s Earn.com acquisition was largely considered to be a [\\$100 million acquihire](#) of Balaji as CTO. But Earn has now done ~\$43 million in (high-margin) revenue in the first nine months of this year. Bison Trails, which the company views as a potential AWS-level bet on hosted blockchain infrastructure, now powers the Coinbase Cloud product, and its \$325 million in run rate staking revenue. The company’s \$55 million Xapo purchase in 2019 snagged Grayscale as a customer, and doubled Coinbase’s assets under custody. Custodial revenues are now \$120 million annualized.

The core exchange’s transaction revenues will continue to be the engine of the business for the foreseeable future, but Coinbase’s distribution and regulatory positioning means they can make other major accretive purchases in the new year as well. Some, like [Neutrino](#) (compliance tech), and [Agara](#) (machine learning for customer service) might upgrade the back office, but I’d expect the bigger deals to open up new revenue lines, like a “Plaid for crypto” ([Zabo](#)) or Institutional Data licenses ([Skew](#)).

The inorganic growth strategy is hardly unique to Coinbase. But the early wins under Emilie are impressive. Something startups should keep in mind as both an opportunity and a threat.

4. Devin Finzer, OpenSea

As a fortunate [early investor](#) in the company (#humblebrag), I can tell you I’ve never before seen a financial profile that looks like OpenSea’s. The world’s dominant NFT marketplace is raking in cash hand-over-fist amidst NFT euphoria, though competition is coming. Coinbase has 3 million users on a waiting list for its soon-to-be-launched NFT platform (four times OpenSea’s [aggregate historical users](#)). FTX rolled out a platform for Solana-based NFTs. Gemini already has [Nifty Gateway](#). Other exchanges will almost universally follow suit with products of their own. Then there’s the open-source tokenized competitors who are lurking, like [Infinity](#), and the [Fantom-based Andre Cronje project](#), Artion.



Devin Finzer:
[View this NFT on OpenSea](#)



Since I'm already privy to a tiny bit of private information, I won't speculate on what the next year will look like, as I wouldn't want accurate "guesses" to look like inside baseball after the fact. But I'll at least provide some thoughts on the company's current trajectory, and the future of NFT marketplaces at a more conceptual level later in Chapter 6.

For now, I'll just say how impressive OpenSea has been in scaling through chaos. Keeping the site humming amidst exponential month-over-month end-market growth, the [occasional bugs](#), and surging Ethereum gas prices. An [unfortunate employee controversy](#) over flipping NFTs the company was curating for its home page. The distracting drumbeat of new competitor announcements. Devin and team have marched on, seemingly unfazed.

I think OpenSea could be a \$100 billion company (or network) eventually, and their critics underestimate their headstart (I watched the same thing happen with Coinbase). I'm hardly an impartial critic, but it's been a losing move historically to bet against category leaders with great teams, and that's OpenSea in a nutshell.

(Check out Devin's two *Bankless* podcasts from [March](#) and [October](#) to get a sense for OpenSea's progression. And of course, go bid on the NFTs in this report!)



Dan Robinson:
[View this NFT on OpenSea](#)

5. Dan Robinson & Dave White, Paradigm

More investors?!? Come on!

Well, yes and no. Last year, I featured Paradigm's white hat hacker samczsun in our top 10, and he had another banner year saving DeFi users from [nine figure hacks](#), even when those exploits happened to [direct competitors](#). (samczsun now sits atop the Ethereum Foundation's [bounties leaderboard](#).) He's not your typical GP.

I'd apply the same filter to Paradigm's nominations this year, given how prolific they've been in producing token economic research for some important financial primitives in DeFi and NFTs.

The Uniswap v3 [automated market maker](#) (which we'll go into deeper detail on in Chapter 7), was largely spawned by Paradigm's Dan Robinson. Things like [Floor Perps](#) (synthetics that allow NFT holders to borrow against assets), and [RICKs](#) & [Mortys](#) (NFT Fractionalization primitives) aim to tackle illiquidity challenges in the NFT markets. [Power Perps](#) (liquid options-like exposure without the need for strikes or expiries), [TWAMM](#) (large AMM orders spread out over time), and [Everlasting Options](#) (co-written with FTX's Sam Bankman Fried) could bring larger and more sophisticated investors to DeFi markets. Those last six were authored or co-authored by Dave White, who joined in January. The useful research output from Paradigm's team is pretty insane actually. And that's only the stuff we know about so far. I'm looking forward to seeing what they have up their sleeves for 2022.



Dave White:
[View this NFT on OpenSea](#)



6. Jeff Zirlin “The Jiho”, Axie Infinity

The Jiho rewrote the playbook on crypto community building this past year. The mission? Conquer the gaming world. The secret weapon? An unassuming Pokemon-like trojan horse of an NFT card game, that would catapult Axie Infinity to the top of the crypto realm.

As head of growth and community at Sky Mavis, the game studio behind Axie, Jeff discovered and cultivated a new untapped audience for Axie’s play-to-earn game - in the Philippines. Everyday, thousands of people there play Axie for fun, and as an income subsidy. The Philippines is now home to 40% of the entire Axie user base, and Sky Mavis recently eclipsed 1 million daily active users. Axie evangelists are hardly in short supply, as the native token AXS (whose design was spearheaded by Jeff) returned 125,000% in the past year (not a typo: 1250x), but some fans are adamant that Axie may end up only being a footnote in the long game Jiho and team are playing.

Axie Infinity itself was a bootstrapping mechanism for Sky Mavis’s Ronin exchange, an Ethereum-linked sidechain designed to facilitate cheap and gamer-friendly transactions. Ronin has generated a billion dollars in revenue since May, holds more than \$9 billion in assets, and is the second largest blockchain by NFT secondary sales. Sky Mavis is one of the fastest-growing game studios in history and recently secured a \$152 million Series B led by a16z. The company put the finishing touches on the walled garden it erected with Ronin, then launched a token ([\\$RON](#)) and decentralized exchange ([Katana](#)) this fall. They’re now positioned to launch an entirely new studio of web3 oriented games and applications to hungry (and wealthy) fans.

Axie’s success has catapulted an entire new genre (crypto gaming) and subgenre (play to earn games) into relevance, with some \$1.4 billion in funding flooding into related NFT projects in Q3 alone. Meanwhile, Ronin has become one of the case studies for modular scaling in crypto. Not bad for a product built under the guise of a fluffy cartoon card game.



Jeff Zirlin:
[View this NFT on OpenSea](#)



Jay Graber,
[View this NFT on OpenSea](#)

7. Jay Graber, Bluesky & Tess Rinearson, Twitter

If any big tech company disrupts itself in a meaningful way with Web3 tech, it will likely be the under-monetized, founder-led social media company with the most thoughtful crypto backer.

I’m talking, of course, about Meta. (Curveball!!)

When I started writing this section, I expected a 30 minute review and quick entry on Jay Graber [taking over Twitter’s Bluesky](#) initiative this summer. “Jay decentralizes twitter” with a mockingjay avatar was my placeholder and starting bias. When I started to actually dig in on Bluesky, what I found was a bit different. There’s been relatively little movement within the Bluesky “community” so far (compare their [Github/Gitlab](#) to [Diem’s!](#)), which made me wonder whether Twitter was



serious in its efforts to disrupt itself and unlock its honeypot of user data. Jay is awesome, but is Bluesky for real, or a shallow sandbox?

Perhaps the “full-stack decentralized media” play wasn’t an appropriate near-term end goal for Twitter given crypto’s current throughput constraints. It was likely premature to hold that expectation on such an early stage project like Bluesky. Instead, the project appears to be focused first on connecting data between *other* decentralized platforms like Mastodon, IPFS, Audius, etc.

That is interesting. And it’s an important bit of foundational work for the decentralized web. It’s just not as self-disruptive for Twitter as I thought at first. Yet.

It doesn’t seem like Amazon faces any meaningful Web3 threats right now (perhaps AWS in the longer-term). Google search and Microsoft Office may have impregnable walls. Apple is still dominant in hardware first and foremost. YouTube could theoretically incorporate Web3 components, but that seems unlikely as they already split revenue with creators (stingily).

On the other hand, Facebook Meta is different. Their rebrand isn’t just an embrace of a Web3 future, it’s a flight to higher ground, born out of political necessity. Survival even. Will we see Libra Diem Novi meaningfully integrated into Facebook’s Meta’s Messenger and Whatsapp products? (They’re trying.) Will we see NFTs built into Instagram or Oculus? (Most likely, if [\\$10 billion / year](#) is the real number they are targeting for metaverse investments.) Will Facebook’s Blue App open its backend and begin to allow its users to license their data directly to third parties? (Maybe! If the other bets pan out.) Could the meta Meta game plan be to monetize the platform’s under-monetized networks first, and pave the way for the impossible: self-disruption of Facebook’s current ad-driven business.

I’m not a Mark Zuckerberg apologist. I simply think that necessity is the mother of invention, past performance is a good predictor of future success, and no one else in big tech has all of the ingredients to go hard after Web3 as part of their core business model. It’s the holidays. Give Mark a chance to stage a Grinch-like comeback.

I’m lukewarm on Twitter’s actual embrace of decentralizing technologies (outside of Jack’s bitcoin obsession). But again, it all comes down to Jay and the BlueSky team. I’m hoping they surprise us.

(UPDATE: Surprise us they did! When I wrote this a few weeks ago, Tess Rinearson’s hire had not yet been announced as [head of engineering at Twitter Crypto](#). That got my attention. I’m much more excited about BlueSky/Twitter in 2022, now that there are two related teams, one of which is a dedicated in-house team reporting to the CTO.

UPDATE UPDATE: Jack just resigned! The non-bitcoin floodgates are open - watch Jay and Tess closely.)



Tess Rinearson:
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Kristin Smith:
[View this NFT on OpenSea](#)

8. Kristin Smith, The Blockchain Association & Katie Haun, a16z

I've got a meaty policy section on the docket this year for a reason. With three years left in the Biden Administration, and the successful passage of the \$1.2 trillion Infrastructure Bill (and its disastrous crypto provisions), there is a lot riding on our industry's policy leaders. It's no small task, either, given how [small their current ranks are](#).

That makes Kristin Smith and Katie Haun critical players in the new year.

Kristin runs the industry's largest dedicated trade association, the [Blockchain Association](#). It's [regarded as the most credible](#) corporate-member effort in DC, and Kristin's team was one of the driving forces behind the furious 11th hour negotiations to amend the crypto broker language

during floor debates this summer. While the effort failed (barely), the fight helped the BA add serious financial resources and talent depth. Membership fees have soared 3x, and she added full-time staff like former Compound General Counsel [Jake Chervinsky](#) and new Government Affairs lead [Dave Grimaldi](#) this fall.

The problem with coalitions, though, is the time and energy it takes to manage the diverse personalities. For instance, the BA counts Ripple as a member, which creates headaches. Its addition of Binance US as a member in 2020 rankled Coinbase to such a degree that the latter [dropped support](#) and has since opted to drive their own policy agenda and back another organization, [the Crypto Council for Innovation](#), with Ribbit, Square, Paradigm, and others. Last I had heard, though, CCI has yet to hire an Executive Director, so the coalition has many months of infrastructure building ahead before it can approach parity with the BA.

That brings us to Katie Haun and the [policy team she has assembled](#) at a16z. The former federal prosecutor, Coinbase board member, and now General Partner at a16z's mammoth crypto fund has recruited a former Hillary Clinton and Biden advisor, a former crypto specialist from Treasury, and former SEC and CFTC commissioners as advisors.

a16z has a megaphone [with tremendous reach](#), and their policy work thus far has been *fast*. The web3 [policy hub](#) they unveiled recently has good starting materials for policy makers, most notably a deck that lays out *why* crypto should be a policy priority for lawmakers, which *specific* legislative proposals (and working language!) could form the backbone of new crypto laws that address core policy concerns without crippling the industry, and *how* staffers can get educated and play catch up on crypto.

We need unity *and* speed right now. The BA and a16z approaches give us a good 1-2 punch going into the new year.



Katie Haun:
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9. Commissioner **Hester Peirce**, SEC

“Crypto Mom” may have been a fitting nickname for Peirce during Chair Jay Clayton’s tenure. These days she’s more like Lord Commander of Crypto’s Night’s Watch.

In the Clayton era, the SEC was hardly a paragon of pro-growth crypto policy, but at least the Commission avoided actively *pursuing* harmful, systemic over-regulation of markets they didn’t yet understand. Today, Winter is Coming, and Peirce is the last line of defense vs. the soulless, melanin-resistant white walker that is Chair Gensler, a man whose life mission is to become Treasury Secretary, by any means necessary, even if that means crippling an emerging industry that [sets back American tech](#) by a decade. (I’m still just warming up. More in Chapter 4.)



Hester Peirce:
[View this NFT on OpenSea](#)

Peirce [criticized the SEC’s enforcement action](#) against Poloniex, for its lack of clarity. She’s been a voice of dissent advocating for spot crypto ETFs since 2018. She’s been [outspoken about improving](#) investment access for non-millionaires, recognizing that [private markets](#) are where all the growth has been in the U.S. markets for years. She’s done that while also staying true to the SEC’s investor protection mandate, advocating for a [modernization of reporting rules](#), and a regulatory “beach” (with lifeguards) vs. a [regulatory sandbox](#) (treating adults like kiddos).

Peirce’s voice has been a welcome source of self-awareness, competence, and restraint emanating from DC. It’s the voice of someone who’s done her homework, and works to find solutions vs. sweeping restrictions against anything that appears new and useful. [Peirce](#):

“When confronted with new technologies, new products, and new ways of doing things, the regulator’s tendency is to say no instead of yes, to say stop instead of go, to see danger instead of possibility...The SEC’s focus is appropriately on investor protection, particularly retail investor protection, and market integrity...[but] investor opportunity matters too. By investor opportunity, I mean the chance for investors to try new products and services, to include in their portfolios new types of assets, to use the latest technologies, to get in on the ground floor of new opportunities, to experiment and learn from investment successes and failures...Investors want protection from fraud and easy access to robust disclosures, but they also want to be able to interact with their financial firms using the latest technologies, to have access to the full range of investment options, and to take charge of their financial future by spending their hard earned money as they see fit. Investors at times may be willing to take on more risk than the regulator thinks is prudent. A healthy regulatory response would resist the urge to override investor decisions and instead engage and educate investors using the same technologies through which they are investing.”

Yes, please. More of this!

Crypto investors notice and [appreciate thoughtful policy](#). Crypto entrepreneurs [notice, too](#). Crypto lawyers like it when policy leaders propose workable [legal solutions](#).

We want more of this!



On [token shilling](#), “Touting securities without disclosing the fact that you are getting paid, and how much, violates [the law]...nevertheless we are disappointed that the Commission’s settlement...did not explain which digital assets touted were securities, an omission which is symptomatic of our reluctance to provide additional guidance about how to determine whether a token is being sold as part of a securities offering or which tokens are securities.”

More of this!

On “**registration-only**” enforcement actions: “Registration violations, even standing alone, are serious, and our enforcement actions can serve to deter such violations and protect harmed investors. We should strive to avoid enforcement actions and sanctions, however, that enervate innovation and stifle the economic growth that innovation brings... Entrepreneurs may be forced to choose between unpalatable options: expending their limited capital on costly legal consultation and compliance or forgoing their pursuit of innovation due to fear of becoming subject to an enforcement action. A regulatory safe harbor could resolve this unhappy dilemma.”

More of this!

On [paternalism](#): “We’re not a merit regulator, so we shouldn’t be in the business of deciding whether something is good or bad. An investor is thinking of their entire portfolio, and sometimes we’re thinking in one-off terms of a particular product on its own. We forget people are building portfolios.”

Most crypto professionals welcome thoughtful regulation, so long as we believe it will be fairly and consistently applied, it’s technically feasible, and it doesn’t violate the Constitution.

Peirce is starting to win over [open-minded policymakers](#) because her positions are clear, consistent, and solutions- vs. jurisdiction-minded. We want and need her defending the wall.

10. Do Kwon, Terraform Labs



Do Kwon:
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At the time of writing this section (Nov 8), I knew I wanted to highlight the “fastest horse” of the year in the competitive “Layer 1” race. Ethereum had rallied nearly 10x on the year, which is nothing to sneeze at, but the real story of 2021 was Ethereum’s blockspace congestion, high fees, and the subsequent explosion of its Layer 1 competitors. Avalanche is up 25x year over year, Solana and Polygon 110x, Fantom 160x. But it’s Terra that has reigned supreme, with a staggering [170x return](#).



ASSET	PRICE (USD)	REPORTED MARKETCAP	1H (USD)	24H (USD)	24H (BTC)	24H (ETH)	7D (USD)	30D (USD)	90D (USD)	1Y (USD)
Ethereum · ETH	\$4,761.33	\$559B	+0.31%	+3.21%	-2.34%	0.00%	+10.29%	+33.33%	+51.79%	+948.79%
Solana · SOL	\$250.63	\$75.76B	+2.25%	-0.25%	-5.62%	-3.29%	+21.51%	+58.05%	+509.64%	+11377.98%
Polkadot · DOT	\$53.14	\$52.50B	+0.37%	+1.40%	-4.05%	-2.89%	+6.27%	+46.25%	+157.85%	+1114.97%
Terra · LUNA	\$52.09	\$20.84B	+0.61%	+2.41%	-3.10%	-1.45%	+18.28%	+22.72%	+212.18%	+17067.33%
Avalanche · AVAX	\$93.09	\$20.59B	-2.38%	+9.25%	+3.38%	+4.50%	+44.22%	+54.56%	+470.27%	+2599.09%
Polygon · MATIC	\$1.89	\$12.87B	-0.12%	-0.38%	-5.74%	-4.22%	-0.79%	+39.69%	+63.25%	+11945.59%
Algorand · ALGO	\$1.97	\$12.26B	-0.51%	+6.03%	+0.33%	+2.66%	+7.98%	+4.57%	+124.30%	+642.78%
Cosmos · ATOM	\$36.16	\$8.10B	-0.94%	+0.80%	-4.62%	-3.13%	-2.37%	+3.57%	+158.23%	+657.42%
Fantom · FTM	\$3.08	\$7.84B	-1.74%	+9.84%	+3.93%	+6.15%	+14.76%	+43.59%	+945.78%	+15932.94%
NEAR Protocol · NEAR	\$10.44	\$5.58B	-0.23%	+0.84%	-4.58%	-3.01%	+3.46%	+30.60%	+267.42%	+1185.29%

I include Do here for a few other reasons, too: 1) Terra is one of the largest crypto investment plays in Asia, and it's the project in the top 10 Layer 1's with the deepest presence in the enormous Korean crypto market. 2) Terra is actually being used at scale as collateral for the second largest crypto collateralized stablecoin UST, which now sits at \$7.2 billion in market capitalization, up from (*checks notes*) \$0 last fall. 3) The breadth of Terra infrastructure (Anchor for lending, Vega for derivatives, Mirror for synthetic securities, Mars for AMM), rivals that of any other blockchain not named Ethereum, and may sit on a more stable, interoperable technical foundation (Cosmos' Interblockchain Communications Protocol) for the long-term.

Most importantly, Do gets the nod here vs. rivals because of his willingness to punch back. After getting served a subpoena at Mainnet 2021 mere minutes before coming on stage with me for a panel, he brushed it off, and decided to take the fight to the SEC with a lawsuit of his own. It's a [fight he might win](#), and an encouraging one to see fought regardless of the outcome.

Honorable mentions:

There are many people within crypto who could easily make the top 10 list each year, but no one has made my list twice. Folks who easily could have made repeat appearances this year include [Balaji Srinivasan](#), whose encyclopedic knowledge and raw processing power is a marvel; Sam Bankman-Fried who's had [plenty of write ups](#) already as the world's wealthiest person under 30; and Michael Saylor, who increasingly looks like he might be on the winning side of one of the ballsiest corporate trades of all time.

Also, a special shoutout is in order for the *Bankless* duo, Ryan Sean Adams and David Hoffman, who [have been right about ETH](#) (but do not make the cut because I think they've been right for the wrong reasons ;)), and have created the highest signal podcast in crypto. One of the few things I consume religiously.



Top 10 Thoughts on Bitcoin

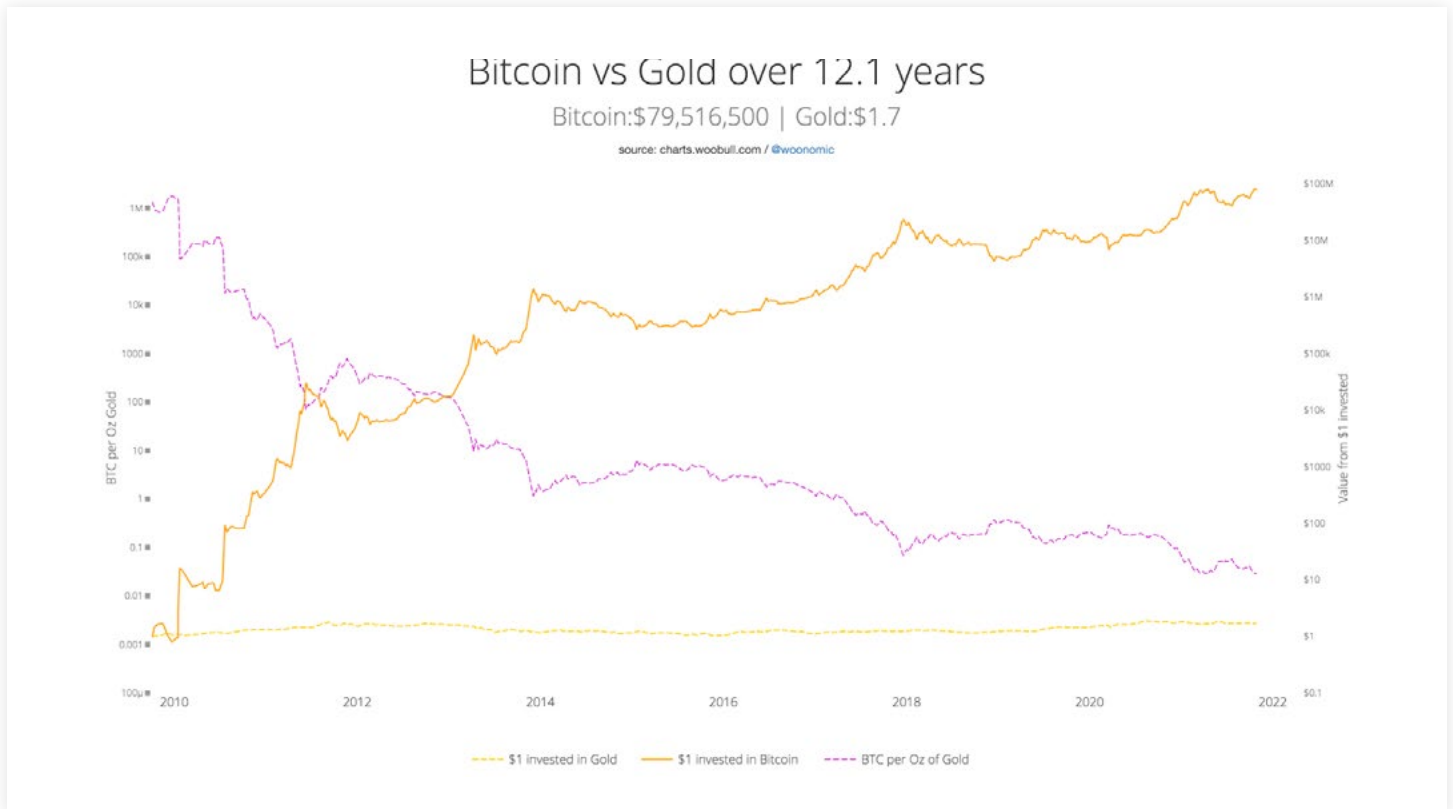
1. Please Check on Peter Schiff	35
2. The King Stay the King: No Flippenings	36
3. The Multichain Reserve	38
4. The “Gift” of Bitcoin ETFs	39
5. The Great Fall of China(’s Bitcoin Industry)	40
6. Bitcoin as Clean Energy Stimulus	42
7. Proof-of-Stake Works Because Proof-of-Work Worked	47
8. Proof-of-Work & Minority Rights	47
9. The Bitcoin Roadmap	48
10. Lightning Strikes El Salvador	49



1. Please Check on Peter Schiff

“Gold will get demonetized so brutally your grandkids will think a golddigger is someone who scavenges for metal scraps in the dumpster to sell for sats.” - [Su Zhu](#)

Bitcoin has eaten gold’s lunch for a decade. This *should* have been a boom time for gold bugs - high inflation, low trust in government, commodities booming - but instead gold was outflanked by a faster, younger, wilder horse in bitcoin. Investing \$100 in gold 10 years ago, would have yielded...\$102 today, underperforming inflation. Meanwhile, investing \$100 in BTC over that time period would have yielded \$1.7 million. Ouch, [Peter Schiff](#).



Source: [Woonomics](#)

Bitcoin shows no signs of slowing down, either. Given its macro tailwinds and multi-cycle resiliency, it’s hard to envision a scenario where bitcoin falls out of favor any time soon while the rest of crypto rallies. From a regulatory standpoint, investors are more comfortable than ever with digital gold. Now that multiple institutional vehicles exist to access bitcoin, and other early adopters have already paved the way ([Paul Tudor Jones](#), [Microstrategy](#), [Tesla](#), [El Salvador](#), [Miami](#), etc.), the “institutions are coming” has flipped to “the institutions are here.”

The strongest tailwind at our back was best summed up by [Marty Bent](#) who noted: “the money owed to pensioners is simply too much, the returns produced are too low, and even when they are realized they are denominated in a currency that is losing purchasing power by the day.” With stocks at nosebleed levels,



bonds yielding negative real returns, and inflation [here to stay](#), bitcoin remains the best liquid bet on [the institutional rotation](#) to inflation-resistant, store of value assets. It won't be the only winning crypto asset, but it *will* continue to pull up the rest of the asset class, as crypto rapidly replaces debt in diversified portfolios.

If quantitative easing actually does debase a currency (duh), then as [Raoul Pal pointed out](#), we'd have a bunch of charts to reflect that (S&P index growing in lockstep with Fed balance sheet, real estate prices rising on a lag after fresh QE, etc.) And we do.



(Source: [Raoul Pal](#), Bloomberg)

[Money printer go brrrr...buy everything.](#) Especially the orange coin.

2. The King Stay The King: No Flippenings

I'd put the probability of a "flipping" next year at *maybe* 20%. And not because ETH is money, no matter what [Sotheby's says](#).

If ETH *does* manage to flippen BTC, it won't be because it is superior "money", but rather because the market values the world's most unique user-owned computing platform and its earnings and growth potential more highly than it does digital gold's. In other words, we'll look at BTC vs. ETH like we do M0 vs. Google.

This isn't an original thought. BitMEX founder Arthur Hayes [broke this analogy down in a piece on the flipping debate](#), where he says 1) it's impossible for ETH to be the world's best virtual computer *and* the world's best money at the same time (I agree), and 2) crypto's largest monetary network will likely be bigger than its biggest distributed tech "company" (yes, again).



That said, it's possible to hold the view that "crypto" as a whole will outperform "bitcoin" (i.e. BTC dominance will decline), while bitcoin retains its spot atop the global leaderboard. Ethereum is a more assailable target than Bitcoin for competitive Layer 1 computing platforms. Ethereum's scarce resource is the finite capacity of its global settlement ledger, and this year proved how quickly other Layer 1s could siphon demand for crypto transaction settlement when Ethereum's ledger gets too expensive. (More on this in Chapter 8.)

On the other hand, Bitcoin's scarce resource is its simple monetary meme. Its pure play "money" competitors are less intimidating: Dogecoin, Shiba Inu, Bitcoin Cash, Craig Cash and the forks of their forks are not much to write home about.

Perhaps you like the Doge! There are plenty of smart investors who do, like Su Zhu [who loves Doge](#) "fundamentally" due to its virality, community, humor, and unserious user base, who spent 2021 driving memestocks to the moon, too.

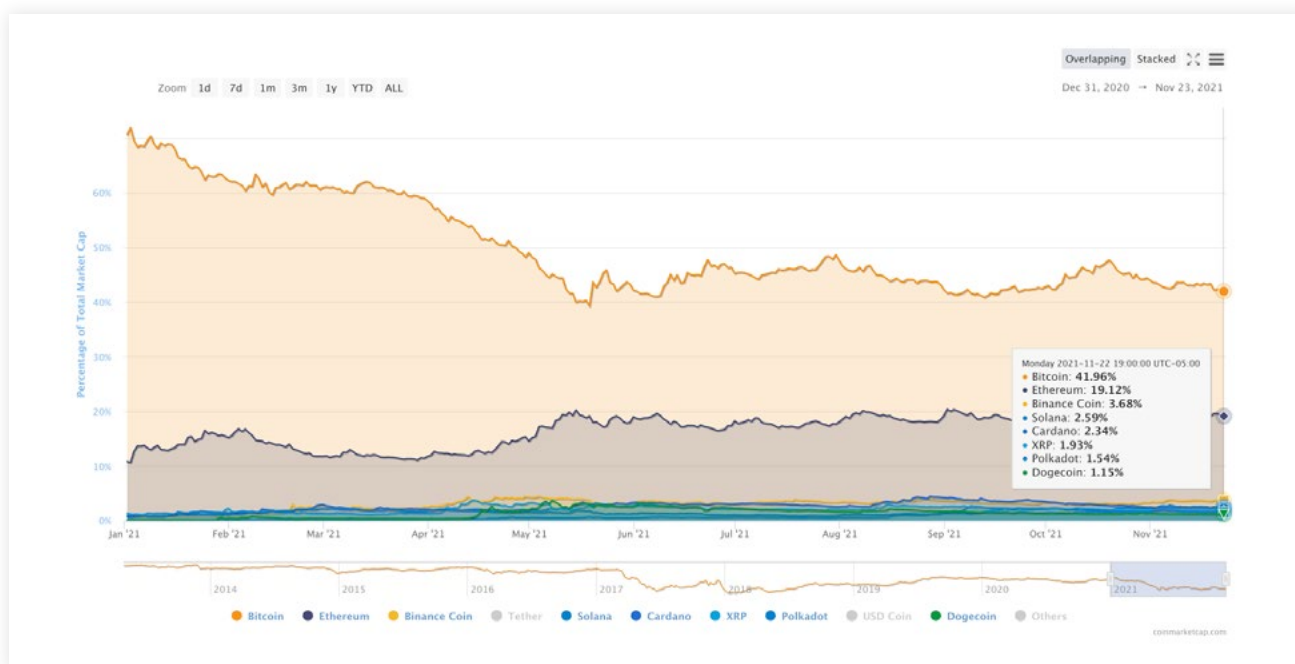
I understand the thesis, but it falls flat in one crucial regard: jokes get old, and even early holders will eventually realize they're sitting on real gains and find a less expensive joke. Reflexivity isn't fun on the way down, there won't be an institutional buy wall for cute Shiba Inus when the trend reverses. An unserious user base could also lead to a large swath of users who panic sell in Q1 once they get their tax forms and realize the magnitude of their obligations.

Bitcoin investors aren't capital gains tax novices. Many Dogecoin punters likely are.

There are two other proof-of-work coins that are also in the currency conversation, of course - Zcash and Monero - but holding them requires a long-term commitment to true peer-to-peer private transactions, and a warm embrace of pain. They might be assets you want to own "just in case" your country breaks down and you need to flee with a bolt bag and a ledger/brain wallet. But the smartest thing I ever did was reverse my dummy-dum-dum "super ZEC long" trade last December and plow it back into ETH where it belonged. I'm writing this with tears streaming down my cheeks, but [Multicoins was right about privacy as a feature](#), and I'd rather make money than be right. ZEC is still 1% of my portfolio, and I still love Zooko, but it's no longer in my top 5. (Others have outrun ZEC. It's not my fault!)

There's really no credible flipping competition for Bitcoin aside from Ethereum, but ETH has to watch its back, too. Bitcoin dominance slid from 71% to 42% this year. Bad. But ETH's smart contract platform dominance also slid from 80% to 60%, and might bleed additional value to its new Layer 2 rollup "allies" that come to market in early 2022.





(Source: [CoinMarketCap](https://www.coinmarketcap.com))

There may be higher upside plays in crypto, but there was nothing wrong with owning [GE during the dotcom boom](#). GE stock went from \$100 in mid-1999, to \$450 in mid-2000, then back to \$185 in mid-2003. In four years, it “crashed” to a level 85% higher than it found itself in the market run-up. That could very well be bitcoin’s trajectory if Web3 reaches Web1 levels of insanity. Would you hate it if BTC crashed from \$275k to \$125k next year?

3. The Multichain Reserve

We’ll talk about interoperability in Chapter 8, but for now, I’ll say that I think [Udi has it right](#): if the future is one of hundreds or thousands of interoperable blockchains, then end users won’t necessarily know or care which blockchains the monetary applications run on. Bitcoin holders will hold and use bitcoin as a digital gold alternative without worrying about the technical details that govern which chain or pegged bitcoin derivative they use along the way. Just so long as the base bitcoin blockchain hums and produces blocks every 10 minutes as a settlement layer.

More than 1.5% of the bitcoin supply is already [wrapped on ethereum through BitGo](#), more than twice as much as was locked at the end of last year. But that may be the tip of the iceberg as millions of bitcoins begin to hit other blockchains as well.

A few demand drivers for bitcoin:

1. BTC will be a reserve on other Layer 1s whereas ETH will be a competitor to them
2. Cross-blockchain bridge protocols like Rune will unlock more peer-to-peer swaps
3. Fears over stablecoins’ independence, censorship resistance, or collateralization could lead to more interest in bitcoin-collateralized crypto dollars.

Ethereum bulls may protest that this is exactly what makes ETH good money and a capital asset: it’s compatible with other EVM chains and Layer 2 rollups, and already collateralizes stablecoins like Maker’s Dai. But that’s backwards



looking. BTC has a 2.5x market cap lead, and a much lower rate of collateralization as working capital *today*, which means it's being underleveraged, and there's a much higher ceiling for new BTC as DeFi collateral than ETH.

I think wrapped / synthetic bitcoin tradeable on other blockchains will double again in 2022 (75% confident we'll see 3% wrapped, at least), as more long-term bitcoin holders realize they can borrow more cheaply against their holdings in DeFi than on centralized services.

(You can read more about the [DeFi assets facilitating bitcoin's interoperability](#) in our report.)

4. The "Gift" of Bitcoin ETFs

We're gonna spend some time on ETFs in Chapter 5 because their approval was one of the most important developments of the year. They also highlight the decade-long ineptitude of the SEC (I know, I know...we're this close to Chapter 4), offer zero redeeming qualities vs. assets acquired directly on custodial exchanges, and generally represent all the things normies were supposed to hate about bitcoin! They're complex, volatile, terrible investments that enrich Wall Street promoters and trend towards zero over time.

Despite the Bitcoin Futures ETFs' toxicity, it's a [fortunate accident of history](#) that the SEC protected retail from them (and Wall Street) by mucking up the approval process for so long. The "Grayscale Trade" (Chapter 5) and its one way inflows may have pulled forward institutional demand from investors looking to capitalize on GBTC's public markets premium AND from a specific form of retail demand for those holding bitcoin in tax exempt retirement accounts. But even then, eight years of SEC foot dragging limited the bitcoin float in ETF-like vehicles to just 5%. An earlier approval could have created centralization risks in bitcoin's money supply - risk that is minor today, reducing the odds Wall Street can ever manipulate the bitcoin markets.

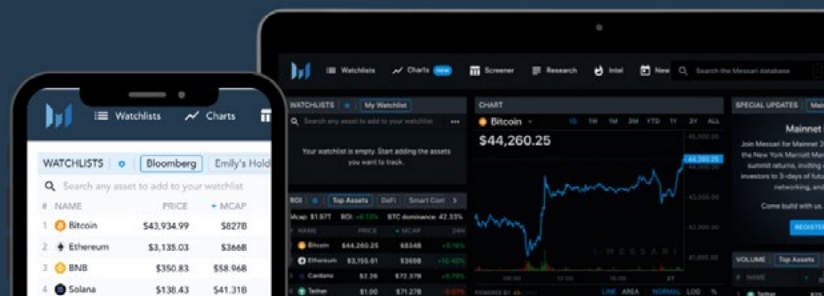
I'll save my juicier predictions on ETFs for the other sections, but my bet is that total BTC locked in ETF-like vehicles will remain less than 10% of outstanding bitcoin supply in the next five years. As other large institutions build positions, the smart ones will go for direct exposure, and lower fees. To the extent we see more than 10% of bitcoin's supply locked in ETF structures, it will likely be due to their inclusion in *other* ETF products, such as Ark Invest's \$400 million of GBTC holdings in ARKW.



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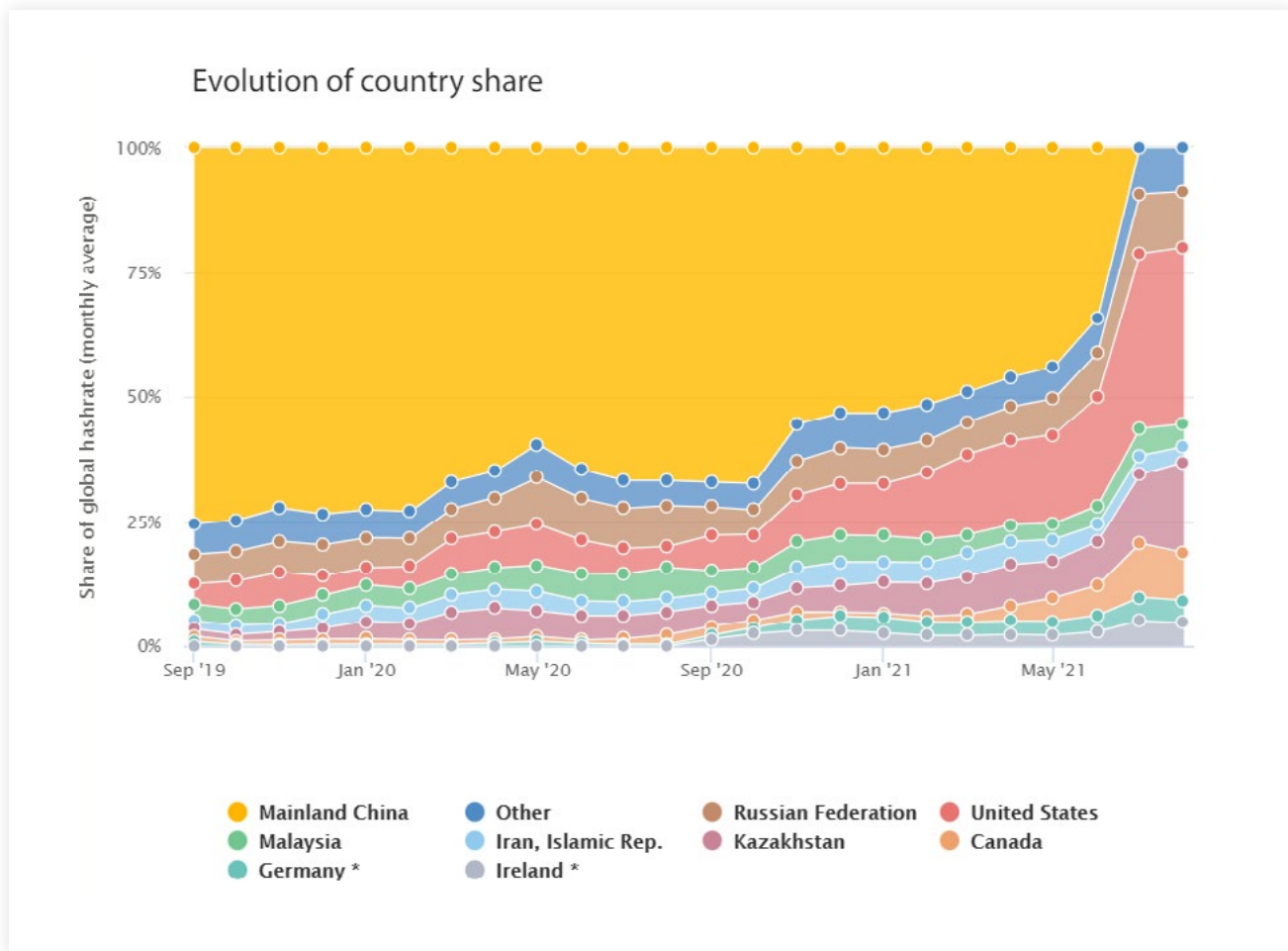
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5. The Great Fall of China(’s Bitcoin Industry)

For years, Chinese miners accounted for over 70% of bitcoin’s hashrate. Then the CCP turned hostile last year, and implemented an [outright mining ban](#) this spring, leading to a multi-billion reversal of fortune for the West, and the most incredible chart I’ve seen in eight years:



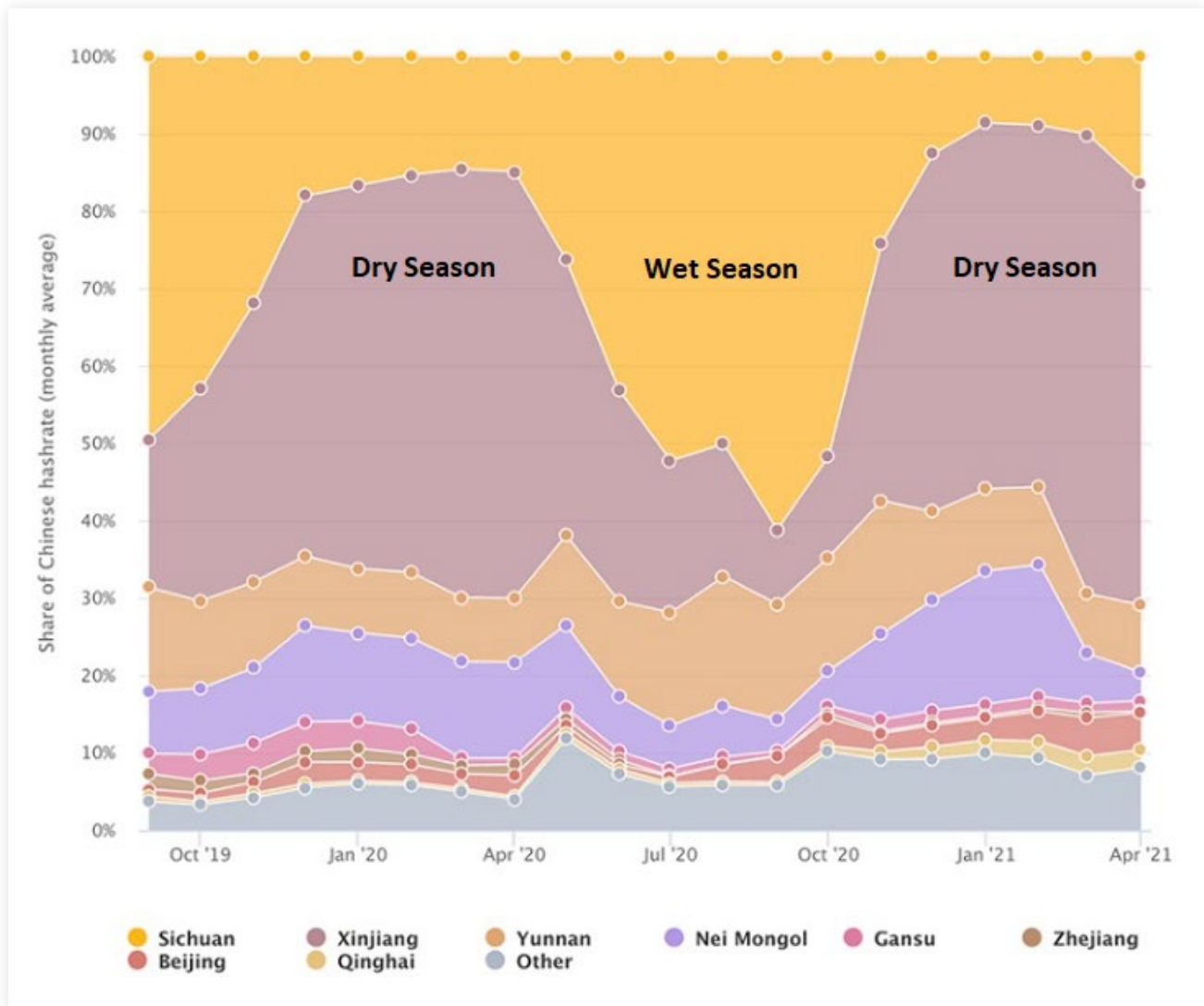
(Source: [University of Cambridge](#))

Now this study isn't perfect, and I'm sure that bitcoin mining hasn't gone to *absolute* zero in Mainland China, but that doesn't make the chart any less directionally insane.

It's hard to overstate how incredible this development was. Since 2013, China's shadow in the bitcoin markets has loomed large. Investors worried what would happen to the network's security if Chinese mining capacity were turned off. It turns out...basically nothing. ~~Hashrate FUD~~: Policymakers worried about the carbon footprint of mining, where China had one of the dirtiest coal-powered energy mixes. That's out, too. ~~Climate FUD~~: Then China [criminalized all trading](#) in an attempt to enforce capital controls and ceded a historic integration opportunity with the open financial markets of the future in the process. Now BTC is back to all-time highs. ~~Geopolitical FUD~~:



What's more! Before the CCP kicked them out, we got tangible proof from the miners that they would migrate their capacity to wherever energy was cheapest, regardless of the source. Each year, you could guarantee that capacity would move to the clean and hydroelectric-rich Sichuan province during the abundant rainy season and back to coal-powered plants during the remainder of the year. The [Cambridge study](#) showed this seasonality in striking detail:



(Source: [University of Cambridge](#))



Last year, I mused that even if China remained dominant in mining, “the giants in the US that may enter [the race], such as Fidelity or DCG...might be ok with mining at a (small) loss to help show they take geopolitical risk seriously.” Instead, the CCP just gifted us an entire industry! DCG’s Foundry even took the top spot in [the global bitcoin mining leaderboard](#) for the first time.

It’s such a senseless strategic blunder that it’s hard to imagine the CCP failing to undo the mining ban at least, even if they continue to keep a close eye on trading and capital controls in 2022. It sounds like these policies are [already being reconsidered](#), for good reason. I predict mining is back in the mainland by mid-year (70% confidence). Especially as the CCP realizes that proof-of-work mining can double as a clean energy stimulus.

Who will take these poor huddled miners.



Crypto Migration
[View this NFT on OpenSea](#)

6. Bitcoin as Clean Energy Stimulus

Senator Warren [warned us](#) we needed to “crack down on environmentally wasteful crypto mining practices” to protect the planet. The European Union’s top markets regulator [warned](#) about “soaring” environmental costs from investing in digital currencies. We were even warned of the “[creeping exposure](#)” to crypto within ESG portfolios - as if bitcoin were a bona fide toxin.

I will admit that it’s bad optically for the global Bitcoin network to consume a lot of energy at a time when world leaders, the media, and [corporate responsibility greenwashers](#) are obsessed with emissions. But bitcoin’s energy consumption is only “a problem” because most politicians and mainstream media pundits are either stupid, lazy, or dishonest. Usually, all three.

Let’s talk about bitcoin’s actual role in our clean energy future. The tldr:

1. Curbing global emissions in a reasonable time period is politically impossible.
2. Still, we should try to curb the biggest emitters to “bend the curve.”
3. Bitcoin can help reduce emissions by recycling otherwise wasted/stranded energy.
4. Mining infrastructure could actually help subsidize new clean energy capacity.
5. All while bitcoin offers S and G solutions in ESG, as well.

Let’s go one at a time.



1. *Curbing Emissions is Politically Impossible*: Will anyone just, like, be honest for one f*cking second? China will not unilaterally curb their emissions in a meaningful way, and they contribute [50%+ to global emissions](#). Some Chinese companies now pollute [more than entire nations](#). And China didn't commit to anything substantial [in recent climate discussions](#). Why should they?

Likewise, do we think Russia is about to rush unilaterally to the climate table? How about Turkmenistan, which boasts 6 million citizens and [31 of the 50 largest methane releases](#) in the past two years, oh and the literal [Gates of Hell](#). India, the world's largest democracy, has laid out plans to get [carbon neutral by 2070](#). 50 years! Great! Whose 50 year forecast has us hitting net zero *before* major currency failures and debt crises (if not hot war and the AI apocalypse)?

Carbon capture and clean crypto. Or climate and political chaos. Those are the options.

2. *Crypto is Eating the World, but Bitcoin Mining Isn't*: The always excellent Lyn Alden broke this down [in a recent post](#), but bitcoin's environmental impact should scale sub-linearly to its economic impact. The "problem" is that proof-of-work mining will either go away in short order (in the event of failure) or consume up to 1% of the world's energy if it grows to a \$20 trillion global settlement layer and systemically important Fedwire complement (or substitute). Big numbers, but not if crypto otherwise automates large swaths of financial services, whose current footprint is closer to 3% of global emissions vs. bitcoin's 0.1%.

Bitcoin's declining inflation rate means declining proportional security spending, which means declining proportional hash rate intensity.

Bitcoin Security as a % of Market Capitalization

Year	Average Market Cap	Annual Security Spend	% of Market Cap
2011	\$38.4 million	\$18 million	46.9%
2012	\$79.2 million	\$21 million	27.5%
2013	\$2.21 billion	\$308 million	13.9%
2014	\$6.80 billion	\$788 million	11.6%
2015	\$3.92 billion	\$377 million	9.6%
2016	\$8.89 billion	\$571 million	6.4%
2017	\$65.1 billion	\$3.39 billion	5.2%
2018	\$129.8 billion	\$5.51 billion	4.2%
2019	\$131.1 billion	\$5.18 billion	4.0%
2020	\$203.5 billion	\$5.00 billion	2.5%
H1 2021	\$854.0 billion	\$16.50 billion	1.9%

By: Lyn Alden

Data Sources: YCharts, NYDIG

Source: [Lyn Alden](#)



If anything, most of us bitcoiners realize that the bigger concern is around bitcoin's current disinflationary supply schedule. The declining block rewards as a percentage of total market cap brings on the risk that, if anything, a fees-driven block reward will not attract *enough* energy to secure the network.

(In most economic circles, you get in trouble for using the word "hyperinflation" as many fear the phenomenon to be a self-fulfilling prophecy. In bitcoin, the same is true for anyone who calls out the risk of *too low inflation*. Raise the issue and prepare to duck from "21million" truthers.)

3. *Bitcoin Recycles Energy*: It turns out that some of the world's cheapest clean energy sources are stranded "off grid" just waiting to be tapped. If only there were some portable, geographically agnostic consumer of that capacity! Proof-of-work miners - as we saw from the Sichuan chart - are those consumers, greedily absorbing the lowest marginal cost kWhs available, like [water on a 3D topographic map](#). (Bitcoin miners are just [benevolent Daniel Plainviews](#), really.) It's the dynamic that leads Nick Grossman and Square and Ark Invest and others to refer to bitcoin as a "money battery."

I hesitated at using this framing initially. It sounds *too* convenient, right? But I've come around.

A perfect example of the money battery in action is in natural gas venting (methane leakage) and flaring (burning methane to carbon dioxide). In the US we flare more natural gas each day (150 TWh equivalent) than bitcoin's peak global annualized energy usage. From [Lyn again](#): "The University of Cambridge estimated that global flare gas recovery potential is 8x larger than the bitcoin network's energy usage in 2021. In other words, virtually the entire Bitcoin network in its peak 2021 form could hypothetically be run off of stranded natural gas in the US, let alone the rest of the world." Flaring converts carbon commodities that would be 100% wasted, into bitcoins. This isn't theoretical. It's magical.

It's also not new!

I wrote about some of the companies doing this work ([like Crusoe](#)) in the Theses *two years* ago. This isn't a state secret, either. The dynamic can likely persist indefinitely. Consider, for example, that 20% of the natural gas in North Dakota is stranded and flared rather than collected. Bitcoin miners are unique in that they might be able to capture value in remote areas like North Dakota - even relative to other energy intensive work like server farm operations - because they have a higher tolerance for network downtime and low bandwidth environments.

Policymakers: for the love of god, your issue is with the American consumer's energy habits and our energy industry, not the bitcoin energy recycling factories. I know it sounds like a fantastical, self-serving narrative, but bitcoin mining really could be this good for America! Not a single marginal polar bear must die as a result. (Bitcoin bears are another story. Every Bear Must Die.) Throw in some subsidies, and American bitcoin mining could be net negative for emissions within a few years.

Even [Ted Cruz gets it!!!](#)

"Fifty percent of the natural gas in this country that is flared, is being flared in the Permian right now in West Texas. I think that is an enormous opportunity for bitcoin, because that's right now energy that is just being wasted. It's being wasted because there is no transmission equipment to get that natural gas where it could be used the way natural gas would ordinarily be employed; it's just being burned."

There's so much potential here. We simply can't squander this gift from the CCP.

4. *Bitcoin as a Green Energy Stimulus*: Let's hammer this home, and think about bitcoin mining not only as a potential net zero emitter, but as Big Energy's sausage makers: processors that take the leftover waste and turn it into something palatable. The coastal elites will scoff at the notion - they don't need bitcoin's [pink](#)



[slime](#) - because they aren't starving for financial products (or prime beef). But what about communities for which mining investments could help plug clean capex budgets? Or emerging markets with vast renewable resources, but little present consumptive demand for all that clean energy?

Bitcoin miners are unique business partners, because they optimize for a single variable (lowest KWh), and serve as a mobile "energy buyer of last resort" for energy that can't be easily transported. You could see nomadic miners incorporated into new clean energy capex for towns that need them to offset sluggish early demand, then kick them out to the next town. The reverse is also true: for low-income countries with cheap energy, miners might help finance or subsidize capex in return for cheap energy rights. (Ark Invest [published its model](#) for how this could work, so you can check the assumptions for yourself.)

Bitcoin mining is already anecdotally - and with increasing frequency - powering clean energy investments. Aside from flaring, there's the [mining facility in Niagara Falls](#) that's taken over a former coal power plant and now leverages hydroelectric power. Its owner previously operated out of coal plants in China. There's North Vancouver, which will be [heated with the 96% recycled energy](#) from bitcoin miners through tech developed by Mintgreen.* Other novel innovations will inevitably arise as well.

If you're skeptical, I don't blame you. I used to think this was more marketing fluff than substance. But China changed all the variables. Ben Thompson nailed it [in a recent post](#):

"One of the biggest mistakes we have made as a society is assuming that energy is intrinsically scarce...Arguments that Bitcoin actually provides incentives for investing in energy abundance are self-serving, but that doesn't mean they are wrong, either!"

Nic Carter [went through a similar conversion](#) from skeptic to evangelist this year, too:

"Bitcoin mining is converging with the energy sector with amazing rapidity, yielding an explosion of innovation that will both decarbonize bitcoin in the medium term, and will dramatically benefit increasingly renewable grids. What's more, it appears that only bitcoin - rather than other industrial load sources - can actually achieve some of these goals."

He credits the emergence of lifecycle mining (newer chips go on grids with high uptime, older chips go wherever the marginal KWh is dirt cheap), a slowing ASIC development cycle (30% of mining happens with chips that are now more than five years old), and hybrid grid-based, and behind the meter mining systems (miners variable consumption in demand-response systems).

Square noted in [a white paper on bitcoin's clean energy potential](#), "As society starts deploying more solar and wind, [we] could potentially unlock profitable new use cases for that electricity like desalinating water, removing CO2 from the atmosphere, or producing green hydrogen."

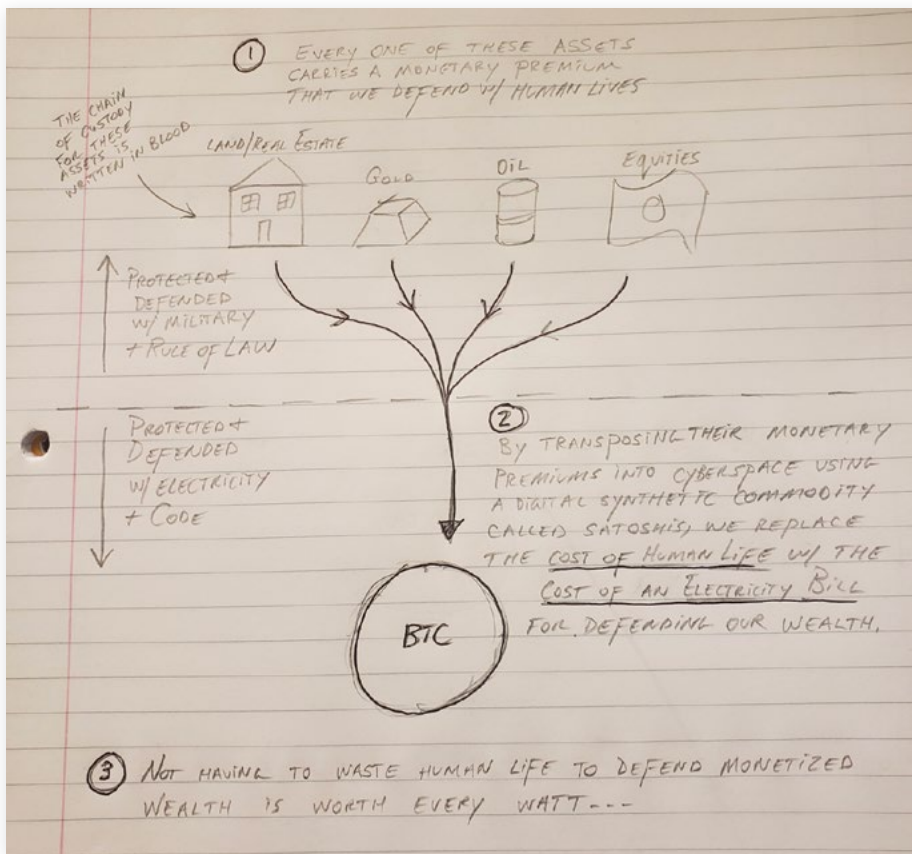
This really could be the mere beginning of a beautiful friendship.

(Further reading from [Lyn Alden](#), [Nic Carter](#), [Square](#), [Nick Grossman](#), and [The B Word](#))

5. *The Cost of the Dollar*: You could argue the financial industry ([25x the carbon intensity](#)) and the military industrial complex ([50x the carbon intensity?](#)) should at least be included in any comparative environmental analysis. But the real problem with ESG militants' attempted cancellation of bitcoin - aside from the fact they're wrong about the negative "E" externalities - is that they also ignore the "S" and "G" benefits of crypto in the process.

Alex Gladstein from the Human Rights Foundation summed it up best in an incredible piece on the [hidden costs of the US Dollar](#). Namely, even if policymakers think bitcoin is irredeemably dirty and wasteful and





(Source: [Jason Lowery](#))

cripling to the future of the planet, they shouldn't be able to discriminate on energy usage preferences when the petrodollar props up authoritarian regimes, leads to military aggression, and fuels more fossil fuel consumption in the process. Enough people believe in bitcoin's value as an investment in new social and governance experiments that its S and G arguably offset even the critic's worst case E scenarios. Bitcoin is inherently political.

Of course, there's another "E" that may prove compelling to policymakers: the economic impact. US mining is big business, with US-listed miners now sitting on [nearly \\$1.5 billion](#) in BTC at current prices, hundreds of millions in annual earnings, and significantly improved profit margins due to the China mining capacity

exodus. That's what Senator Cruz [latched onto this fall](#) in thoughtful remarks on the subject at a bitcoin conference in Austin.

Mining infrastructure is something that could even lead to some unusual alliances between someone like Ted Cruz on the right, and AOC on the left. If you want the economic growth that comes with crypto, and you want to subsidize and stimulate green energy investments, subsidize [clean mining](#)! It's a single, zero-sum global market, which means that clean energy subsidies would drive out more expensive "dirty" mining. The net result would be a bitcoin network with low carbon intensity, dominated by the West.

(This doesn't even have to be done at the government level! Nic [also points out](#) that ESG investors could invest in renewables-only, publicly traded miners, like Iris Energy, and have the same effect as government subsidies by lowering green mining's cost of capital.)

Ok, ok, I'll move on. But I can't help but get fired up about this subject when politicians and the media just outright lie about the dynamics. Do your homework.



7. Proof-of-Stake Works because Proof-of-Work Worked

“PoW and PoS are not substitutes, they are not even complements, they are two fundamentally different things and should not be compared or contrasted.” - [Meltem](#)

As with the “BTC is money, no ETH is money” debate, this is one of those areas where the two sides talk past each other. Proof-of-work burns energy in order to prove the network is providing fair settlement assurances at global scale *without* reliance on the network’s owners, who could easily centralize over time. The separation of transaction processing incentives and ownership responsibilities is important for a network that aims to be a non-sovereign alternative to money.

By contrast, it’s suitable to think of proof-of-stake networks (which employ token holders as collective governing bodies) as business analogs. Each individual proof-of-stake network comes with centralization, censorship, and coercion risks, but that’s ok!

The real PoS decentralization comes from the thousands of interoperable PoS blockchains, which will each offer their own unique token incentives, emissions schedules, governance rules, target applications, etc. over the long-term.

You wouldn’t want a monetary system where Elon Musk owns a large percentage of the money supply *and* a large vote in which economic activities were valid on that underlying network *and* a large claim on the fees and seigniorage generated by that network. Too much power over one half of all transactions. On the other hand, you’d probably have no problem if he accumulated a similarly large percentage of a decentralized self-driving taxi service, as it’s merely a single web3 application.

Proof-of-work’s success paved the way for proof-of-stake research to be taken seriously. That doesn’t mean PoS will overtake PoW as a superior security model. Nor does it mean PoW will prove infallible. It means PoW was first, and probably still best, for stateless money apps.

(More reading on PoW vs PoS security: [only the strong survive](#) & [rationality is self-defeating](#).)

8. Proof-of-Work Protects Minority Rights.

My former *CoinDesk* colleague, Pete Rizzo, [wrote a thought-provoking piece](#) arguing that Bitcoin’s social contract, proof-of-work mining scheme, and bias for user activated “soft forks” make it the only crypto protocol to protect minority rights amidst the “tyranny of the majority” offered by hard forks.

If you read up on the debate on twitter, this may seem academic or semantic, but it’s probably one of the most important things a new *institutional* entrant to crypto should seek to understand. We’re five years removed from the only major contentious hard fork in Ethereum’s history, and four years removed from bitcoin’s “user-activated soft fork” which ended a multi-year scaling battle between exchanges, miners, users, and core developers. If you didn’t live through that, it’s tough to describe how risky these political rifts can feel, and how badly protocol politics could go wrong in future stalemates.

For instance, do you think the most likely path to censorship is in soft-forked code activated by a validator network whose incentives are tied to ongoing transaction processing? Or code that’s hard-forked and activated by the majority of the owner base, whose incentives are tied to the capital they have accumulated?

Bitcoin’s bias for soft fork upgrades prioritizes “user coercion over secession” - keeping the family together sort of like a “drag along” shareholder provision. You’re ultimately getting pulled through to the new version of the



protocol automatically once a large enough contingent of users signal their support of the fork. With Ethereum on the other hand, it's more like an iOS upgrade. Yes, new hard forks are "opt-in" for users, but only in the sense that they either submit to the upgrade or lose access to the primary network. This tyranny of the markets diminishes over time in an internet of blockchains that isn't dominated by Ethereum. Exit = Choice.

I don't hold a strong opinion here, since I'm invested in both Bitcoin and Ethereum and believe both will succeed. It's worth further study if you're new. This is also a dense section. I'm sorry for the 301 level, interlude, but I didn't have time to simplify it after 800 hours of writing.

([Vitalik's thoughts](#). [Pete's thoughts](#). [Hasu's debate](#). A [book on the scaling saga](#) if you're new.)

9. The Bitcoin Roadmap

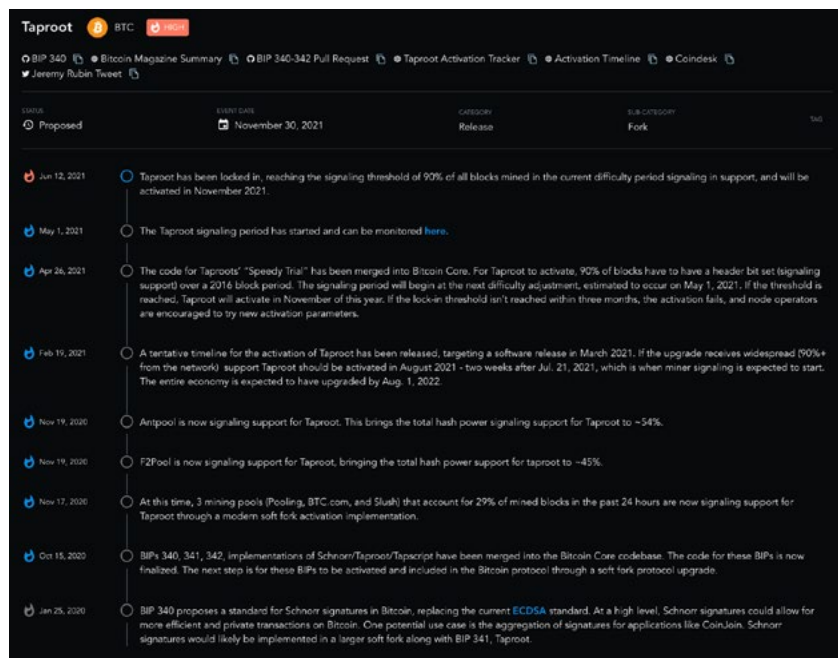
It was a full four years since Bitcoin's last major upgrade and soft fork, and things were a bit less controversial this time around. Nearly the entire global bitcoin mining apparatus signaled support for the "Taproot" upgrade this spring, and the upgrade went into full effect in November.

(As an aside, you could have easily tracked the full lifecycle of the Taproot BIPs - not to mention protocol updates for 200 other crypto networks - using our [Intel product](#).)

For the [layperson](#), Taproot makes bitcoin transactions cheaper, its adoption of "Schnorr signatures" will enhance bitcoin's privacy defaults and fungibility by making all transaction types (simple payments, lightning channels, and multi-sig transactions) look the same, and it could unlock the next phase of development in Bitcoin's Lightning Network, which may finally break-out next year after years of me writing that it may finally break out next year.

To be honest, Taproot does seem like a big deal for privacy and Lightning, but less so for bitcoin's [smart contract future](#) (we've been talking about "sidechains" since 2014, and they lost). As discussed earlier, bitcoins could be wrapped as collateral on other platforms at scale, but that still won't make bitcoin technically integral in new smart contract applications [outside of payments](#). I've invested in a couple of companies leaning on Lightning (e.g. Kollider* and its real-time settled derivatives exchange), and I'd like to see Jeremy Rubin's [Sapio](#) succeed, so I'm cautiously optimistic there will be winners here.

But I've also been around long enough to curb my enthusiasm for bitcoin applications outside of the payments and store-of-value settlement use cases. An independent alternative to Fedwire is plenty big, thanks. Indeed, bitcoin is at 300k on-chain bitcoin settlements per



day vs. [800k daily Fedwire settlements now](#). When you consider that hosted services frequently leverage single transactions to batch hundreds or even thousands of smaller transactions at a time, Bitcoin has already overtaken Fedwire in throughput. Lightning could crank the pace up even further.

Development on bitcoin is like building a rocket, while development on Ethereum has historically been more similar to building a Silicon Valley startup. The stakes are higher in bitcoin (arguably, we'll get into this in Chapter 6), and you need rocket science level security to build a reliable cryptographic alternative to Fedwire. Ongoing updates and investments in bitcoin's core code and communications infrastructure show what I'm talking about.

v22.0 (released this fall) connected bitcoin to a second anonymous communication protocol, the Invisible Internet Project, in order to complement the Tor integration and build resiliency to bitcoin's secure messaging capabilities, making it even harder to de-anonymize users. Blockstream's efforts to shoot [bitcoin satellites into space](#), sounds quirky, but it also guarantees network access anywhere society (and the internet) breaks down.

That doesn't make bitcoin a bet on a Mad Max future. Instead, it's a life raft for refugees current and future. "Societal breakdowns [don't happen everywhere at once](#). That's the point of having 190+ countries & then adding a borderless value transfer layer." The work is important.

(Further reading from [Bitcoin Magazine: Aaron's the best technical bitcoin writer out there](#))

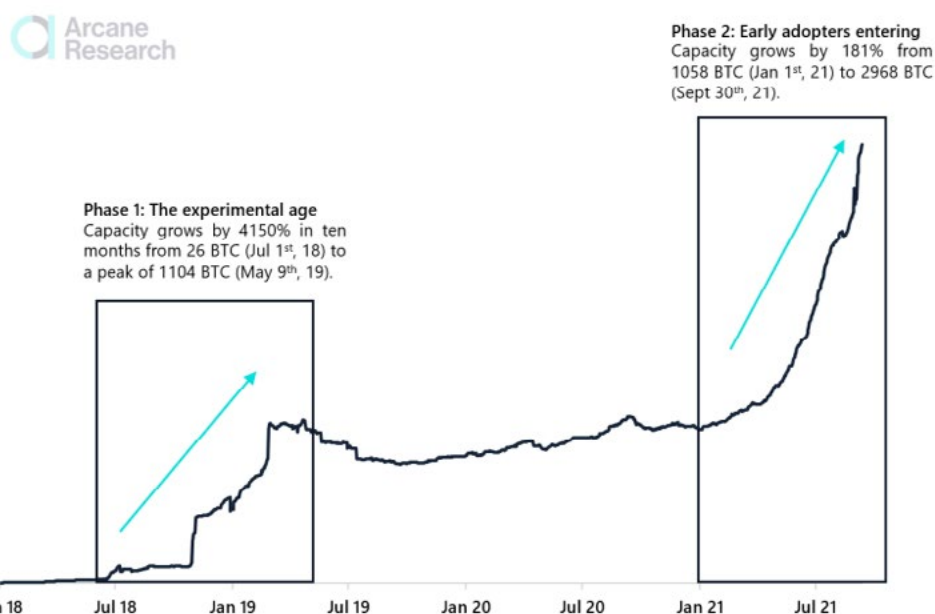
10. Lightning Strikes El Salvador

It seemed like Lightning had lost the payments footrace to dollar-backed ERC-20s definitively. Lightning saw negligible growth in 2020 in channel capacity and nodes. Even as channel capacity exploded over the summer this year and sits [3x higher in BTC terms YTD](#), it has just \$200 million in total capacity, while ERC-20 stablecoins are set to clear \$5 *trillion* of settlements on the year with no capacity limits.

For all their progress, though, neither ERC-20 stablecoins nor any other crypto asset accomplished what bitcoin did this year as "money." I'm talking, of course, about bitcoin's acceptance as legal tender in El Salvador. It's amazing what happens to usage when you complete the closed loop payment system without forcing a reconnection to a fiat reserve.



Figure 3 – Lightning Network: Public BTC Capacity 2018 - 2021



(Source: [Arcane Research](#))

We're still talking about small numbers in comparison to DeFi, but it's still legal [actual currency](#) we're talking about for six million people, not tokenized fiat currency that rides crypto's rails, and might be shut off at a moment's notice.

I'm sure I'll be wrong about Lightning again. But I could see Lightning capacity getting to 30,000 BTC of capacity by the end of 2022 (another 10x next year) thanks to Twitter, Taproot, and President Ukele's aggressive Lightning roll-out plans. Potentially higher if other countries like Paraguay or Ukraine follow the [bitcoin game theory](#).

I like Lightning. It's cool. I'm a sucker for the [Strike demos](#). I'm a sucker for the news 2.7 million Salvadorans will [get airdropped \\$30 in BTC](#) for downloading their new Chivo wallets, and which allow users to pay with Lightning on their phones. I'm sure it's [all just propaganda](#). I'm a sucker for Twitter's [Lightning tipping service](#) going live for 186 million users. And I'm a sucker for believing [Snowden](#) might be onto something when he estimates countries with 650 million underbanked adults could make similar moves to El Salvador as part of a post-USD monetary strategy.

More than anything, I just want bitcoin as legal tender to work, and don't want to be taxed 20% on my f*cking coffee orders any more. I'm getting worked up just thinking about how stupid our crypto policies are in the U.S. Good thing it's time for my policy screed.



American Crypto Policy

1. The American Battleground	52
2. Real Risks & Self-Regulation	53
3. FSOC & SEC Dominance	55
4. The Crypto Coalition	56
5. Regulatory Jump Balls	57
6. Crypto Eurodollars and Systemic Risks	58
7. Smart Crypto Banking Integration	59
8. Crypto is Bad for (Bad) Business	60
9. Tax Enforcement vs. Tax Products	61
10. Dear Gary Gensler: Are You a Partial Fraud or a Total Fraud	62
11. Ripple vs. SEC vs. Safe Harbors	67
12. The Battle for Privacy	69
13. Incorporating DAOs	69
14. The American Web3 Council	70
15. Local & Metaverse Battles	72
16. There's Nothing More Punk than the Battle for American Crypto	72



Crypto policy used to move at a glacial pace. Exchanges and hosted wallets have [always been subject to oversight](#) from dozens of global regulatory bodies, and token teams have operated under the watchful eye of securities regulators from day one, but things only kicked into high gear these past six months, especially in America. That's what happens when you cross \$3 trillion in market capitalization, and crypto policy becomes an existential priority.

This fall, the President's Working Group for Financial Markets (PWG) [released a report on stablecoins](#) that called for Congress to pass new, urgent legislation to "fill regulatory gaps." Biden's Infrastructure Bill passed with its disastrous "broker" definition intact, not to mention an intrusive extension of the Bank Secrecy Act's Know Your Customer (KYC) requirements that [might create impossible individual compliance burdens](#). SEC Chair Gary Gensler claimed sweeping authority over [stablecoins](#), and reiterated his tough talk on enforcement and his belief that most crypto assets were unregistered securities.

The US isn't alone in its struggle to find balance in crafting effective crypto policy. As we discussed last chapter, China banned most domestic crypto activity to prevent the "[disorderly expansion of capital](#)." India grew more open-minded, then reverted back to [open hostility](#). Israel proposed a dystopian financial reporting rule requiring citizens to [report all assets over \\$61,000](#) (crypto privacy = felony).

There are *some* thoughtful locales. Japan's Financial Services Agency has [created a division to tackle DeFi regulation](#). Portugal offers [0% capital gains tax treatment](#) on crypto, doesn't tax foreign income, and has been recruiting crypto innovators. Within the US, cities like Miami and states like Wyoming have been building crypto safe havens.

Most countries seem keen to advance their central bank digital currency initiatives even as they look upon decentralized finance with skepticism, a predictable trend we'll cover in Chapters 5.

But as we begin our deep dive on policy, we'll first map out the American battleground.

1. Setting the Stage: The American Battleground

"This is an unbelievably fast-growing industry. It's growing 1.5x to 2x as fast as the internet in terms of adoption. You'd be an idiot as a politician to say, 'Oh we don't want that around.'"

- Novo (D)

"The US is either going to embrace crypto and win, or ban crypto and disintegrate."

- TBI (R)

I've heard crypto referred to in recent months as "pre-political." That's a good thing given crypto's bipartisan appeal, and global potential. But one of the more worrying trends I've seen these past few months has been the slow Republican embrace of crypto as a political football.

I say that as someone who sits right of center on the political spectrum. And also as a guy who helped meme "single-issue voter" into existence over the summer during the furious battle over the Infrastructure Bill's disastrous "broker" language.

The truth is, Republican regulators (so far) look to have been more sympathetic and reasonable when it comes to crypto. We've had across-the-board downgrades this year to many members of the executive-appointed Financial Stability Oversight Council, and other Congressional positions of authority. It wasn't an unexpected directional swing, but I definitely didn't have "Ted Cruz is our top Senate ally" on my 2021 bingo card.



Opportunism? Perhaps. That's politics, baby. Anyone smart, knows it will pay to be an ally in the Senate to an exponential growth industry in need.

What we really need are more champions like Democratic Sen. Ron Wyden because we clearly don't have many (any?) friends within the Biden Administration or the Progressive wing of his party. Senator Elizabeth Warren is one of the most influential Senators on financial services. She hates crypto. Other up-and-coming Democratic members [are hostile, too](#). Perhaps we should be thankful we haven't seen more legislative action on the docket, because it would be terrible. ([This bill](#), for example, is a trainwreck.) There isn't really a good reason for Progressive animosity, either.

This pro-crypto [open letter to Elizabeth Warren](#) from a young Progressive highlights how important crypto could be to the Democratic agenda. Not only does crypto democratize access to financial services, encourage collectivist-owned, open alternatives to tech monopolies, and offer [mobility to the historically disenfranchised](#), but its success could drive tax revenue, and potentially fuel green investments.

We need to win over these technological progressives quickly because losing America is not an option: US policy will dictate whether we have a golden decade of growth like the 90s or whether other Western countries slowly follow our lead to create a global dystopian CBDC hellscape. If you listen to [Balaji's predictions](#), things look pretty dark in the US today, and a balkanization and national divorce seem possible, if not likely. [Punk6529's thoughts](#) are more aligned with mine. Let's fight and win the battle here while we can.

In the remainder of this chapter, I'll lay out a) the key issues and players to watch in the US policy fight, b) six substantive issues we need to confront head on (stablecoin and banking risks, anti-money laundering, tax evasion, investment fraud, and exchange oversight), c) two FUD issues, which are bad technically, but lack substance (securities rules and privacy issues), and d) where we can win smaller battles while we fight the multi-year war in DC.



*Punks in Congress
View this NFT on OpenSea*

2. Setting the Stage: Real Risks & Self-Regulation

In a battle with a superior fighting force, you at least need to maintain the moral high ground. Most of the real policy risks crypto presents are solvable, and we have a number of obvious opportunities to garner goodwill with policy makers and head off crises before they emerge:



- **Exchange Risks:** User crypto funds aren't FDIC insured. Hacks, exchange outages, and identity theft are possible. On the other hand, if users control their own wallets and lose the keys, or send a fat-fingered transaction, they can lose their assets permanently. Hosted services should educate users on crypto risks, and security best practices.
- **Stablecoin / Lending Risks:** Our central bank high priests can't respond to crypto booms and busts with adjustable monetary policy or serve as a lender of last resort. This is a feature. But we should recognize that crypto *does* weaken monetary sovereignty in some areas (Argentina), and that trend will accelerate as assets like bitcoin become units of account (El Salvador). The Fed will either lose control over the exploding crypto Eurodollar system (Tether) or it will wise up and embrace projects like USDC and Paxos.
- **Banking Integration Risks:** Banking access for crypto companies continues to present a single-point-of-failure risk for the industry. On- and off-ramps to the "real world" are arguably the only existential needs the industry still has. We need more compliant, chartered crypto banks to prevent shutdown risks, and individual deplatforming risks.
- **AML Surveillance Risks:** Illicit activity accounts for just 0.34% of crypto transactions (lower than TradFi), but the borderless and pseudonymous nature of crypto makes embargoes and blacklists difficult or impossible to enforce. This is bad narratively in a political realm driven by zeroism: look at the costs we have incurred fighting the War on Terror, the War on Drugs, and the War on COVID. We should continue to drive down illicit activity, while pointing to blockchains' surveillability as a law enforcement godsend.
- **Tax Evasion Risks:** The government might come after you with guns if they find that you misreported your crypto trades, or suspect you have unreported private transactions, or believe that you transact individually with the wrong people. Most of the biggest tax compliance concerns center on information incompleteness and disorganization. That's one exchanges should accept tax reporting responsibilities on behalf of their users.
- **Securities Fraud Risk:** Crypto is risky and volatile. The fat early tail often makes money at the expense of the latecomers. That doesn't make crypto a "ponzi scheme", it makes it a bubble-producing tech paradigm subject to hype cycles, like railroads or the internet. (No "bubble" has ever crashed, then resurged 10x higher in regular four year cycles.) The challenge we have is in reducing information asymmetries. We should advocate for holdings-based disclosures, community reporting standards, and a Safe Harbor.
- **Protecting Privacy:** We might have to agree to disagree here, and fight them on the beaches when it comes to transaction privacy. Peer-to-peer transaction reporting, and disclosure requirements on self-custodied assets are unconstitutional overreaches. Get a warrant, or we'll [see you in court](#).

This list isn't exhaustive, but it covers the big issues in broad strokes. Before we get to them in depth, you also need to understand the players on both sides. Good news on that front: Uncle TBI spent time cosplaying in DC while you were flipping Ape jpegs this summer. You may make better life decisions, but at least I can help bring you up to speed.

Leave Congress aside for a minute, and let's focus on the regulators who will be interpreting, enacting, and enforcing crypto policy for the next several years.



3. Setting the Stage: FSOC & SEC Dominance

In the US, crypto is [at the mercy of the Financial Services Oversight Council](#) (FSOC) and its 10 voting members. There's the Federal Reserve (Fed), the Department of Treasury, the Commodities & Futures Trading Commission (CFTC), the Securities & Exchange Commission (SEC), the Office of the Comptroller of the Currency (OCC), the Federal Deposit Insurance Commission (FDIC), the Consumer Financial Protection Bureau (CFPB), and a couple of others that are less directly relevant to crypto.

FSOC is a byproduct of Dodd-Frank, responsible for identifying risks and emerging threats to the financial system. That means it has the statutory authority to organize a policy response to emerging tech like crypto. The committee is chaired by the Treasury Secretary, and aims to ensure there are no blind spots in the US financial regulatory framework. As the US makes up [38% of the world's financial markets](#), FSOC's impact is effectively global.

I'll get into how each regulator fits into our policy responses in the sections below, but first, a glimpse on where each regulator sits on crypto *today* to provide a sense of what lies ahead.

Fed: Jerome Powell's Fed hasn't been overly hostile to crypto, but they are net negative on it as a potential systemic risk and threat to their policy tools. The Fed seems more likely to have strong opinions on stablecoins, than cryptocurrencies more generally as they roll out the initial [design scope for their CBDC](#) (a white paper from the Boston Fed is imminent). Powell told Congress he wouldn't try to "ban" crypto. Thank god he was reappointed. [Brainard](#) has been elevated in status, but would have been much worse.

Treasury: Stephen Mnuchin was no crypto ally, but Janet Yellen is worse, and has a better aligned group of colleagues working with her at FSOC. Her push for the crypto broker provisions during the Infrastructure Bill battle (remember: they fought tooth and nail [*against* the bipartisan amendments that were proposed](#)), and clear interest in beefing up tax enforcement is bad. Her [support of wealth taxes](#) also makes future IRS disclosures on crypto *holdings* likely.

SEC: Gary Gensler is an ambitious and highly competent political operative, who's been clamoring for more authority to regulate crypto tokens and the exchanges that trade them. He's leaned into his "cop on the beat" image, and has embraced regulation via enforcement. He even won concessions to play a leading role in stablecoin regulation, convincing the Administration's working group that these assets were equivalent to ["stable-value funds."](#) Hester Peirce has to throw some haymakers to protect us from our protector, [Goldman Gary](#).

CFTC: We lost "crypto dad" Chris Giancarlo (approved BTC futures), then Heath Tarbert (approved ETH futures), then Brian Quintenz (who at least went to a 16z's crypto lobby). New Chair Rostin Behnam was on Gensler's old CFTC team. None of the current commissioners are crypto friendly and there's been no rush to fill vacant seats. DeFi enforcement actions soon?

OCC: Former Chair Brian Brooks issued interpretive letters that clarified how regulated USD-pegged stablecoins could have their deposits custodied by banks, and how banks could custody crypto assets. Today's Acting Comptroller Michael Hsu wants to end these arrangements, which he calls "banking-as-a-service." The next OCC Chair may be [a literal Communist](#), and we know Treasury is pushing to regulate stablecoin issuers as banks.

CFPB: The Consumer Financial Protection Bureau was Elizabeth Warren's baby. Warren hates crypto, and wants the [CFPB to crack down](#) on its "abuses." New CFPB chair, Rohit Chopra, called out stablecoins in particular as a [key area of scrutiny](#) for his team.



FDIC: Chair Jelena McWilliams [told an audience at Money 20/20](#): “We must be cognizant that our American values, culture, and influence face increasing competition from abroad, including from regulatory systems that focus intently on promoting technological innovation and taking the mantle from the United States.” Thank you! Unfortunately, FDIC’s role in crypto is minor compared to the other agencies. I only include Jelena to show that not all regulators are bad.

Suffice it to say, the Crypto Coalition in DC has its work cut out next year.

4. The Crypto Coalition

There are basically five major crypto policy players in DC today. They are mostly corporate backed, with limited grassroots engagement outside of the aerial support Crypto Twitter can provide during major battles (e.g. the Infrastructure Bill). While none are perfect, they’ve all punched *way* above their weight this year, and have gotten significantly stronger.

Coin Center: OG think tank, bitcoin-centric, cool merch & [nerd prom](#), keep the team small intentionally. These are ones focused on education and advocacy vs. corporate lobbying, and they tend to be focused on the big picture Constitutional issues (privacy rights, code as speech, and why crypto is important and should be treated fairly). They pick their battles.

Blockchain Association: Top trade association, backed by the major crypto startups, growing fast, big lobbying efforts, more aggressive. They also have to balance member egos and alignment, a challenge with any trade association, but perhaps especially acute in crypto. Ripple is a member. So is Messari. Binance US became a member, but that led Coinbase to defect. Still, BA is the best in town, and they got stronger this fall (see Kristin Smith, Chapter 2).

The Crypto Council for Innovation: New trade association, spearheaded by Paradigm, elite backers, but little infrastructure. They have plenty of capital, but there’s a lot to be done, and not a whole lot of time to do it, which means CCI will likely be more influential as coordinating members vs. an actual organization this cycle until they have an actual team in place.

a16z Policy Team: Massive headcount and top advisory talent, enormous financial resources, influential founders and crypto fund GPs, representing an extensive portfolio. Their “we’re going fast and driving the agenda” approach is a necessary evil(?) given the imminent threats we face. They proposed an excellent starting point for [Web3 policy](#). It’s unclear if they’re taken seriously in DC yet, or if they’re viewed as more of a West Coast novelty, but their success is arguably the most critical out of this group given their ability to move *fast*.

The Chamber of Digital Commerce: I like the Chamber. We’ve supported them in the past. They’re one of the oldest advocacy groups in DC. They have a lot of great working groups and publish good research. I am not privy to all of the inside baseball, but [there is a rift](#) between the Chamber and the rest of the policy groups above. I’ll leave it at that.

There are other groups worth monitoring as well, including the [DeFi Education Fund](#) and [Fight for the Future](#). There are tools that keep sprouting up to help with policy engagement ([Connect to Congress](#)), and we also need a grassroots, individual member org (a crypto NRA!) to engage the base and ensure the populist voice of crypto is well-represented. I have been vocal about this need, and will [personally help support grassroots efforts](#) with the right leadership fire power. Messari will also invest in policy research. We’re looking for a leader to lead our policy efforts.

(Join the fight: Donate to [Coin Center](#). Apply to join the [Blockchain Association](#).)



5. Setting the Stage: Regulatory Jump Balls

Contrary to popular belief or political attack lines, crypto entrepreneurs and investors *want* smarter crypto policy. We simply don't want the tech regulated out of existence within the US.

Don't get me wrong, crypto has likely benefited greatly from the lack of clarity and clear, single-regulator oversight rules to date. The exchanges will gripe that they spend inordinate amounts of money fulfilling requests for the Treasury, SEC, CFTC, OCC, DOJ, but that's the cost of doing business as a money transmitter in fintech generally, and the "jump balls" have usually tipped to their benefit, as crypto has (clearly) thrived in the gray areas.

That gray area will get more black and white next year, and we must be proactive about good policy, while staying on message. In brief, the crypto agenda boils down to seven key issues:

- Ensure financial stability with clear stablecoin rules & careful bank integration (Fed/OCC)
- Set clear guidelines on KYC/AML reporting while preserving privacy (FinCEN)
- Clarify tax rules, and set exchange reporting standards (IRS)
- Create Safe Harbors for community governed tokens (SEC)
- Introduce DAOs as a new organizational structure (Congress)
- Harmonize exchange oversight (Create "The Web3 Commission")
- Allow for state and city-level experimentation (Courts / Enumerated Powers)

Congress loves acronyms, so the SPECIAL Act could cover everything: S tablecoins, Privacy, Exchange tax reporting, Community Safe Harbors, Incorporated DAOs, American Web3 Council Local experimentation.

Smart legislation may seem like a big ask from this gridlocked Congress, but ultimately, it's critically important for American economic competitiveness and national security, it [would have bipartisan support](#), and it would net the government more tax revenue. Dumb policy, by contrast would squander our early lead, and push offshore a transformative tech ecosystem.

In the next six sections, I'll outline areas where there tends to be philosophical alignment between crypto leaders and policymakers that some regulation is needed, but also extreme frustration that policymakers are not listening, and instead proposing "solutions" which run counter to their actual policy goals.

Don't miss your chance to own one of Messari's first NFTs from the "Messari 2022 Theses" collection. Each unique piece of crypto art tells the story of the year behind us, and the year ahead.

Check out the full collection designed by pop surrealist artist Jean on OpenSea.



6. Crypto Eurodollars and Systemic Risks

"Crypto is the new shadow bank. It provides many of the same services, but without consumer protections or financial stability that back up the traditional system. It's spinning straw into gold."

- [Satan](#)

The first is arguably the biggest issue we face: the regulation of dollar-pegged stablecoins, which presents a double whammy for policymakers.

First, there is concern that stablecoin issuers are helping to create a parallel digital dollar economy outside of modern financial surveillance systems. This is somewhat true.

Crypto dollars are like digital cash. The banks custody the underlying dollar deposits, the ATMs (or in crypto, the exchanges) dispense the cash, and what happens with the cash afterwards is somewhat opaque. It can slush around the cash economy "off the books" or someone can bring it back to the bank, which then tracks the deposit's return into the regulated (fully surveilled) financial system. Cash monitoring is usually a FinCEN/IRS problem: anti-money laundering and tax compliance falls under Treasury's purview. But as stablecoins have grown, the Fed has also grown more uneasy around the potential systemic risks posed by their growth.

As a \$3 trillion asset class, with \$150+ billion in stablecoins, \$5+ trillion in annualized on-chain volume and perhaps an order of magnitude more in reported on-exchange stablecoin transactions, crypto is starting to route around regulated banking, which impacts policy.

MESSARI

Quarterly Stablecoin Transaction Volume

In Q3 stablecoin transaction volume once again surpassed \$1 trillion, despite taking a dip during the summer downturn



Data as of: Sept. 30, 2021
Source: Messari, CoinMetrics



Stablecoins power highly speculative bank- and dollar-enabled markets which offer rates that obliterate their TradFi partners and competitors. DeFi lenders and TradFi lenders (commercial banks) do play by different sets of rules, and the banks don't think that's very fair. Banks have been preaching to regulators for years - first with fintechs and now with crypto - "same activities, same risks, same regulations." Acting OCC Chairman Hsu's emphasis on holding "[Synthetic Banking Providers](#)" to bank-like standards reflects that. Regulators worry that DeFi "run risks" could ripple to deposit-holding banks themselves.

FDIC Chair McWilliams' stance is slightly different: she thinks entities [issuing crypto dollars](#) outside of the banking sector should be backed 1-to-1 to explicitly avoid run risks. But that's what makes crypto markets different today: most stablecoin and lending activity has been done on a fully collateralized basis so far. The key, then, is auditing reserves and solvency.

As I'll explain in Chapter 5, there *is* justifiable concern over the lending practices and reserves of stablecoin issuers (e.g. BlockFi's Grayscale Trust exposure). We should know which assets back Tether and USDC and Paxos, etc. and we should know about the solvency of major crypto lenders, whether they are public or private. Regulation that prioritizes reserve transparency is something we should have rallied around years ago, given it cauterizes the persistently negative Tether headline risks without killing legitimate regulated stablecoins like USDC and Paxos.

The alternative to reserve transparency is a [crackdown so severe](#) that it looks more like an outright ban on stablecoins. This is what Senator Warren seems to advocate for. What she calls "[Wildcat Banking](#)" (a meme, which was hilariously brought to market by [one of the primary AIG risk modelers](#) that helped lose \$185 billion and crash the global economy), can more appropriately be seen as the bi-product of years of regulatory neglect and failure to connect crypto exchanges to banking services.

Sure, we could pursue a central-bank digital currency, but that approach will take time, and is not without concerns of its own. In the meantime, we'll cede leadership over better, faster, cheaper payment tech to other countries while protecting old US financial rails from competition. And we'll exacerbate the current "crypto eurodollars" problem. Foreign banks already create eurodollar balances for transactions that never involve onshore US businesses or US banks in the first place. Regulatory hostility could *accelerate* the growth of crypto eurodollars like Tether.

Better to integrate crypto into the US banking system directly.

7. Smart Crypto Banking Integration

"These things are effectively treated by users as bank deposits. But unlike actual deposits, they are not insured by F.D.I.C., and if account holders begin to have concerns that they cannot get money out, they might try and trigger a bank run."

- [Lee Reiners](#), former supervisor at the Federal Reserve Bank of New York

The other issue crypto presents to policy makers are the potential systemic risks of bank runs. Bringing crypto exchanges under banking regulations may make more sense to policymakers than opening up crypto to existing banks.

Stablecoins are powerful innovations that improve the interoperability, integration, and ultimately, the export of the US dollar. They are also getting systemically important in some markets. For instance, a run or crackdown on Tether could create dislocations in "real" markets like commercial paper, while USDT provides no clear value to the US.



On the other hand, granting depository institution charters to fully reserved crypto banks would solve some major problems. These “crypto banks” would be eligible to apply for payment system access and FDIC insurance, they would offer the Fed better supervision of the crypto dollar markets, and they would limit how companies (foreign and domestic) could “rent” their access to banking.

Conversely, bringing crypto to TradFi bank balance sheets would likely be a horrible idea. Standard banking processes may prove too incompatible with crypto. Avanti CEO Caitlin Long pointed to some important structural differences in a [recent comment letter to the Fed](#): how would the Fed handle a hard fork on a blockchain with stablecoin deposits? How might banks account for intra-day “bank run” risks given crypto’s volatility and real-time settlement vs. current [collateral requirements](#) and daily settlement? Is the Fed comfortable with crypto’s lack of reversibility (no permitted failures to deliver, collateral substitution, etc.)?

From the crypto *industry’s* standpoint, direct integration and oversight by banking regulators *for stablecoin issuing banks* would also help mitigate one of our single-point-of-failure risks: the concentration of “real-world” on-ramps and off-ramps.

It’s big business for whoever gets it right: Silvergate’s book value has more than tripled since the start of the year, from \$300 million to over [\\$1 billion in equity](#), while its stock has rallied 10x since last fall. I predict multiple new crypto banks (like Avanti) will become unicorns in 2022.

8. Crypto is Bad for (Bad) Business

The whole “crypto is for criminals” schtick is categorically false - a myth perpetuated only by the ignorant and the willfully misleading. As mentioned earlier, illicit activity comprises just 0.34% of crypto transactions [according to Chainalysis](#), lower than incidence of illicit activity in “regulated” financial services, where banks have been notoriously [effective money launderers for cartels](#) and [ultra-rich tax evaders](#).

At the same time, crypto exchanges continue to be one of the primary allies in the fight against criminal activity. Binance recently helped [bring down a \\$500 million ransomware gang](#). Most hackers by now understand that there may be more money made in white hat hacking, than black hat hacking. Those that don’t quickly get a lesson in how the money is [too hot to handle](#) or launder, as we saw in the \$610 million Poly Network hack this year.

There seem to be weekly reminders that using crypto for nefarious purposes leaves an [excellent paper trail](#) for prosecutors to lock in a conviction. People who build products that aim to serve dark markets almost [always get caught and go to jail](#). And law enforcement is only getting more resources and better tools: Treasury has asked for [more funding](#) to track and fight crypto crime. The DoJ has set up a [national cryptocurrency enforcement team](#).

If you’re using crypto for illicit activity, you are more likely to get caught than you are using cash. One exception (and it is admittedly a challenge) is [ransomware](#). It creates a ton of [headline risk](#), it’s a big problem, and the solutions aren’t obvious. That said, crypto-powered ransomware will exist even if crypto were “banned” globally. Crypto would simply become a [black market currency](#). In the meantime, this relatively small problem today is a call to action to make critical security upgrades across our corporate and government infrastructure.

Crypto is not a panacea. Like any new open technology, criminals can use it, too. That doesn’t diminish its value. And it seems the State Department agrees! They are paying [pseudonymous cybercrime whistleblowers in crypto](#). (It’s “dangerous” but effective!)



9. Tax Enforcement vs Tax Products

Let's be real for a second: no one wants to pay more taxes than they have to.

The tax code is complex enough, and crypto's decentralized tooling, lack of exchange reporting standards, and evolving financial models make it especially difficult to track and consolidate taxable income each year. I understand why we're in this mess with the Infrastructure Bill's broker language, and how the Joint Committee on Taxation could have scored improved crypto tax compliance as a \$28 billion "pay-for" even if they didn't show how they derived the numbers.

Crypto accounting [is a nightmare](#) - tax reporting doubly so. It's less likely that crypto investors are evading taxes, so much as struggling to report clean data.

For illustration, these are some issues you might have scrubbing data at one of the \$10 billion+ exchanges. (They are all a disaster.)

- No on-chain transaction history for withdrawals 90+ days in the past, making wallet identification for transfers and cost basis tracking nearly impossible.
- No transaction and trade history prior to 2020.
- No consolidated fills on orders, meaning each order can spit back 100s of transactions that each require disclosure in a Form 8949.
- No short sales tracking in current tax reporting software as these can break certain services' trade verification engines.

That's to say nothing of the challenges that come from valuing airdrops or illiquid forks, writing off complex DeFi transaction costs, or explaining seigniorage shares or fractional NFTs to the IRS. Oh, and the US is seriously entertaining the idea of taxing unrealized gains. What do we think that would do to the illiquid crypto markets? (Aside from "protect investors", of course.)

Crypto tax reporting leads to some fourth amendment concerns around unreasonable searches and seizures, but it's really the eighth amendment (cruel and unusual punishment) that should be cited in tax audit defenses. I don't know a single crypto user who wouldn't be thrilled to have reliable tax reporting software that correctly categorizes income vs. wallet transfers vs. capital gains and tracks cost basis, while identifying liabilities and potential tax loss sales.

There's nothing that pisses off crypto taxpayers quite like being regularly defamed by the insider-trading rats in DC while we pay (insert lots of digits) of dollars, hundreds of hours, and dozens of blood pressure points dealing with tax reporting each year.

TaxBit isn't a [\\$1.3 billion company](#) because crypto users refuse to pay what they owe. It's a unicorn because it prevents people from going postal.

I expect we'll see a wave of M&A in the crypto tax accounting space in 2022 as exchanges see the writing on the wall and make (frankly, much needed) compliance investments under the new tax reporting laws outlined in the broker provision. Unfortunately, I also think we'll see at least one also-ran crypto tax accounting firm break bad and sell to the US government on a variable fee model that rewards them for hunting down potential tax shortfalls.

I also predict we will once again see next to no clarity on dozens of crypto tax reporting issues from the IRS. (But you already knew my confidence was low.) The one thing we do know: this may be the last year to take advantage of [crypto's wash sale loophole](#).



10. Dear Gary Gensler: Are you a Partial Fraud or a Total Fraud?

I've gone after current SEC Chair Gary Gensler pretty aggressively this year on twitter. I'm about to go even harder. I think he's a liar and a fraud, and I'm gonna tell you why.

Before I unload, I should reiterate that I believe strongly in the SEC's mission: 1) protect investors - primarily against information asymmetries in the investing markets; 2) ensure the financial markets operate fairly and efficiently; and 3) promote capital formation in the US.

The same mission underpins what we do at Messari.

We organize and curate crypto data at scale in an attempt to level the information playing field, highlight risks and opportunities in the space, and ultimately drive fully informed decisions - in new investments, new integrations, new governance proposals, etc. In my 2017 launch post, I wrote about the need for a [crypto EDGAR and ICO self-regulation](#). Hester Peirce's Safe Harbor and its draft disclosures framework maps closely to what we've been collecting for years already from crypto communities.

So yeah, I am a fan of the mission, and I've been doing it full time for as long as tokens have been a thing. This ruffles some feathers, but I'll say it again: I have [personally](#) been [more effective](#) at [protecting investors](#) from [information asymmetries](#) than the SEC has. If we're looking at the spirit of the law, Messari will continue to outperform the SEC in its core mandate.

We don't disagree over the spirit of securities laws, but rather their applicability to crypto. The SEC seems hellbent on asserting its authority over the entirety of the crypto market: Web3 protocols, exchanges, the decentralized finance ecosystem, even stablecoin issuers. But before we give them that authority, we should look at the options we have for crypto oversight. There are three: 1) allow crypto to blossom with little regulatory oversight, 2) rigorously apply securities law to crypto and chill token innovation, 3) embrace a cooling off period and Safe Harbor, and wait for a new, measured regulatory framework from Congress.

Libertarians will prefer #1. The SEC Chair seems to prefer #2. Pragmatists will like #3.

No regulator is going to willingly cede authority they might otherwise claim, so #1 is a non-starter. There's no political brownie points for abdication of leadership, and it's *Congress's* job to clarify where regulatory authority begins and ends. Still, with gridlock in Congress, a smart regulator might evaluate whether their current approaches are working. In the SEC's case, is regulation through enforcement actions effective? Or are new tactics warranted?

Let's look at what the SEC is working with.

Gensler is overstretching his staff to the [point they may strike](#), while crypto builders are leaving cushy 9-5's to join the 24/7 crypto fray. Crypto has the clear enthusiasm upper hand because builders here feel their cause is just. Is the SEC deserving of respect when their policies [favor Wall Street](#) vs. retail, or they block innovations that could help artists, gamers, musicians, and other creatives break [free from the monopoly platforms](#) that exploit them?

The SEC's work itself is complex, expensive, and time-consuming - a thankless game of whack-a-mole given crypto's exploding size and complexity. When they pick fights, they can end up going against former senior colleagues who now make multiples of money playing for the other team. Imagine [fighting your former Chair](#) in a high stakes enforcement case?

When they do win, the victories are pyrrhic: their crown jewel settlement was a [paltry \\$24mm slap on the wrist](#) to Block.One for its \$4 billion continuous token sale of EOS in 2017, an event that literally leveraged



promotional billboards in Times Square. The EOS token sellers kept the proceeds then redeployed **\$10 billion** (EOS sale proceeds plus gains!) into [a new private exchange](#). Token holders got access to a broken, depreciating network that the original developers were effectively *forced to walk away* from lest their efforts make EOS “look like a security.” Meanwhile Block.One privatized a historic wealth transfer.

Does anyone on SEC staff feel good about that “victory”? Can they?

Projects that ask permission from the SEC hit brick walls. SEC engagement either breaks products technically, racks up years and millions of dollars in legal expenses for non-existent benefit, kills products before they launch, or gets held against the engaging party in court. No one in crypto trusts the SEC, nor should they. (Others can't say that. I will.)

The SEC's expansive interpretation of securities law as it pertains to crypto is not working, and it's embarrassing that Hester Peirce seems to be the only leader there who recognizes the need to take a different approach.

“Let's give Gary a little bit of time!” you might say. It's only his first year on the job and he's juggling a bunch of different priorities. He didn't bring the Ripple case, [Jay Clayton did](#). He didn't stonewall the Bitcoin ETF for eight years, he finally let one through. He didn't write [the DAO report](#) or settle the Block.One case, and he certainly didn't author the *Howey* opinion. He's merely working with outdated tools because Congress hasn't yet addressed the crypto issue.

Fair enough. Then let's look at his positions so far:

- **Crypto ETFs:** I'll expound upon my feelings about the toxic bitcoin ETFs in Chapter 5. For now, know that the SEC's eight year delay on approval caused investors to [miss 800x worth of appreciation](#) in the underlying asset, a catastrophic failure of the SEC's capital formation mandate.

That's not on Gensler. But here's what is: prioritization of futures-based ETFs that will incur 5-10% in hidden annual costs in “contract roll” (that benefit Wall Street) vs. the spot-based ETFs modeled after the world's largest commodities fund (the SPDR Gold ETF). Why approve an exotic futures structure vs. the superior option with 80% lower fees and 40x the liquidity? Well, Gensler wants to kick liability over to the CFTC (who regulate the bitcoin futures), and hold out until Congress grants him oversight authority on the crypto spot markets and their exchanges. It's hostage taking, and it's also designed to slow institutional inflow to crypto as few mutual fund managers will choose to hold such a toxic, expensive futures-based asset within their funds. Gensler is operating in bad faith when he denies this plain fact.

- **The Safe Harbor:** It's one thing to oppose Hester Peirce's Safe Harbor. It's another to feign ignorance and lie to Congress. Which is what Gensler did in October when asked directly about the Safe Harbor from Rep. Patrick McHenry. He evaded an answer with a sly bit of misdirection ([watch for yourself](#)), and McHenry nailed him on the follow-up!



PM: "Have you reviewed the Safe Harbor?"

GG: "I haven't reviewed your bill."

PM: "Have you reviewed Commissioner Peirce's Safe Harbor?"

GG: "We talk actively about a number of matters."

PM: "Specifically, have you reviewed the Safe Harbor itself?"

GG: "We've talked about her thoughts on the Safe Harbor."

[PM: "Senator Selkis, the floor is yours."]

SS: "Chair Gensler, I don't care about water cooler run-ins with Commissioner Peirce. Answer the f*cking question: have you read the document itself? It's eight pages, and addresses many of your concerns about information asymmetry and investor protections within the crypto market. Have you read it? Yes or no?"]

I know I'm naive, but if you're in a position of authority, and you want an industry to trust your intentions, you shouldn't lie to Congress about your knowledge of a critical, widely publicized alternative to your bumbling, ineffective ten year strategy.

- **No Action Relief & Reg A+ Registration:** Three years ago, former SEC Commissioner, Bill Hinman, suggested that emerging crypto networks could become "[sufficiently decentralized](#)" as they scaled, such that exchange of their underlying assets might no longer represent securities transactions subject to public disclosures rules. Even if the projects had previously launched via a token sale! If a Safe Harbor is unpalatable, perhaps the SEC could advise on paths to "sufficient decentralization" or at least expedite the Reg A+ process for bringing tokens to market?

Don't hold your breath. Props [shut down this August](#) after a \$21 million 2019 offering: "We have not been able to develop Props Tokens in ways that could lead to commercial success, and there is no reasonable prospect of that happening in the future, given the regulatory framework, [which makes it impossible] to follow anything remotely like proper product development of 'launch, measure, iterate.'" It took [Blockstack \\$2mm](#) and two years of legal work, but they at least survived the Reg A+ process themselves. They now sit at #75 in market cap, though it's unclear any user has ever read their filings, and their token is not tradable in the US. Its liquidity relies on overseas exchanges. What, exactly does a Reg A+ offering get you? And Gensler wants new projects to keep registering this way and talking to the SEC?

- **ATS Stonewalling:** Gensler's most dishonest position may relate to that now infamous, "come in, talk to us" line to exchanges. Coinbase CEO Brian Armstrong even called the SEC's behavior "[sketchy](#)" and claimed the Commission refused to meet with his company's leadership or provide any written clarity on its reasoning for blocking one of Coinbase's new lending products.

The behavior *is* sketchy. Coinbase and the other exchanges have been trying to comply for years, and several have even acquired broker dealers. It's *the SEC* that has kept their broker applications caught in limbo. For years. Watch lawyer [Collins Belton explain](#).

This shouldn't be surprising! Gensler himself has stated that it might be [impossible to bring crypto exchanges into regulatory compliance](#), and that the path forward might need to flow through the exchange incumbents! ("Should they even be allowed to register? The world will go on without these 200 exchanges. Somebody else will fill this space. I know that might be a dramatic thing to day, but it would be maybe ok.")



Message: the damage is done, and only national securities exchanges should be able to trade crypto. It's flagrant. And because crypto pros aren't insane, and we're notoriously difficult to gaslight, we don't trust this guy. We know exactly who he is.

We also know from Ripple's court proceedings that invitations to engage with the SEC are being used as [evidence against the proactive party](#). Gensler recently told the [Securities Enforcement Forum](#): *"I've asked staff to cut back on meetings with entities that want to discuss arguments in their Wells submissions."* Come in and talk with us. We'll use it against you, and then resist clarifying discussions. Ok, Gary.

Peirce (of course) [called out the absurdity](#) of the SEC's invitations to crypto entrepreneurs in light of the SEC's enforcement-centric approach:

"Sure, Poloniex could have tried to register as a securities exchange or, more likely, as a broker-dealer to operate an alternative trading system [and] waited . . . and waited . . . and waited some more. Given how slow we have been in determining how regulated entities can interact with crypto, market participants may understandably be surprised to see us come onto the scene now with our enforcement guns blazing and argue that Poloniex was not registered or operating under an exemption as it should have been."

That's why she is the only leader at the SEC with a shred of crypto credibility.

- **Anti-ETH Pressure:** The SEC is also sneakily dialing up the anti-crypto pressure in less obvious ways. They've turned up the temperature on '40 Act funds (the \$30 trillion mutual funds and ETF industry) who have considered adding exposure to non-bitcoin crypto securities, such as Grayscale's ETHE. One fund manager told me his firm had gotten approval to hold ETHE from a regional office of the SEC before the DC office politely called back with a roster of lawyers a couple of months later and let them know, "actually, no, we haven't blessed any crypto securities outside of bitcoin trusts." Several other fund lawyers confirmed that the SEC has remained hostile to non-bitcoin securities, which essentially calls into question Hinman's prior public comments on Ethereum. Even bitcoin isn't viewed favorably. It was merely grandfathered in.
- **Stable Value Coins:** The most transparent power grab we've seen has to do with Gensler's push for oversight of the stablecoin market, [which he got](#) by cleverly rebranding "stablecoins" as "stable value coins" a nod to SEC-regulated "stable value funds." To be honest, I have less of a problem with this than his other positions. As discussed previously, it's probably better to resolve our banking integration challenges than continue to back stablecoins with commercial paper or other less liquid products.
- **American Crypto vs. China Stonks:** I know whataboutism isn't great, fact-based debate. But it should piss you off that Chinese companies trade freely on US securities exchanges while [willfully skirting securities disclosures laws](#), and American crypto innovators don't get the same latitude, despite more good faith engagement.

The Public Company Accounting Oversight Board (PCAOB), oversees audits of publicly traded companies, and maintains a list of foreign companies that have refused SEC requests to audit their filings. Wouldn't you know it, 95% of the companies on their list have auditors based in either mainland



China or Hong Kong. You know. Small outfits like China Petroleum & Chemical, China Mobile, JD.com and other \$10 billion+ businesses, and billion dollar IPOs like iQiyi, Pinduoduo, Nio, and Tencent Music.

Gensler is giving those companies [a three year grace period](#) to comply with PCAOB guidelines, but won't entertain a three year crypto safe harbor. Are you f*cking kidding me? Is the difference that Wall Street makes money from one group and not the other?

- **Protecting Who, Exactly?** Crypto is starting to highlight just how damaging the 80 year old "40 Act" and its outdated accredited investor rules are. These rules block users from receiving [earned token rewards](#). They prevent companies from going public until most of their growth has been captured privately. Things like investment company ownership rules don't prevent fraud, they [enable them](#). (I've seen it myself.) The income and wealth thresholds for accreditation are themselves [exclusionary and racist](#). Surely someone woke enough to insist on avoiding the title "Chairman" while awkwardly insisting on referring to [Satoshi Nakamoto as "she"](#) would take interest in crypto's popularity with underserved communities, and note their vote of no confidence in TradFi. Right?

Underrepresented groups are indeed [voting with their wallets](#) (13% of white investors have crypto exposure compared to 18% Black, 21% Hispanic, and 23% Asian investors), and yet the SEC continues to work hard to stop them. The paternalism is especially breathtaking, given the fact that crypto has delivered the goods. It's the *only* asset class where retail has made more money and had more access than institutions at every step of the way. The sector has outperformed literally everything. It's the ultimate tool for protecting investors that need it most - the historically disenfranchised.

Bitcoin & Traditional Assets CAGR

	Bitcoin	Gold	S&P 500
1 year:	+299%	-0.04%	+31%
2 year:	+171%	+13%	+23%
3 year:	+117%	+16%	+20%
4 year:	+76%	+10%	+16%
5 year:	+146%	+8%	+17%
6 year:	+141%	+10%	+15%
7 year:	+107%	+7%	+13%
8 year:	+88%	+5%	+13%
9 year:	+162%	+0.87%	+15%
10 year:	+177%	+0.50%	+14%

What is it: This shows bitcoin's Compound Annual Growth Rate (CAGR) vs other assets over various timeframes. For example this is showing that bitcoin has returned 155% on average, every year, for the past 5 years, while gold has returned 7% on average each year over the same period.

Why it matters: As with the historical bitcoin price table, we see bitcoin's extreme outperformance vs other assets here as well. These CAGR numbers solidify bitcoin's status as the best performing financial asset in history.

(Source: [Case Bitcoin](#))



That's a lot of evidence against Gensler. But "liar and fraud" are loaded terms that imply malice. Could it be that naivete is to blame vs. bad faith?

No. This is not a case of ineptitude or technical naivete. What makes Gensler so dangerous and grimy is his competence and his ambition. He's an elite performer who amassed a [\\$120mm fortune](#) from a successful career at Goldman Sachs. As a former CFTC Chairman, he knows how DC's political machine works, and how to burnish his resume, play hardball, and keep his name in the news. As a former MIT professor on crypto, he's more familiar with the tech than most others in DC policy circles. He's cunning and calculating.

To hell with the SEC's mission. He's holding an entire emerging industry hostage - partially at the behest of Senator Warren - as he curries favor in his ascent [towards Treasury Secretary](#).

Look, I've dealt with a number of smart, talented, earnest, and well-intentioned professionals at the SEC. I won't name drop them here (for reasons that are likely obvious now...I don't want to get them into trouble), but I do respect them and in a perfect world would love to collaborate more closely on our shared missions.

Gensler holds them back. He's a fraud. American investors, and SEC staff, deserve better.

11. Ripple vs. SEC vs. Safe Harbors

I am, how you say, not a Ripple fan. I've called the company the [Jekyll and Hyde of crypto](#): cool, real-time gross settlement and remittance tech, but shady MLM-level marketing and retail dump of its centralized stash of XRP. If you've been around for any length of time in crypto, you know that Ripple CEO Brad Garlinghouse and I do not exchange Christmas Cards.

But from the day the SEC's enforcement action against them dropped last fall, I've been rooting for them to prevail vs. the SEC because the case feels dirty, and [it could set terrible precedent](#).

We know from [Ripple's court proceedings](#) that despite three years of meetings with company executives, the SEC never informed Ripple or its partners that the Commission believed the company's digital currency, XRP, was a security until they initiated an enforcement action. That alone is damning. I'm not a lawyer, but I know that baiting a company to engage over *three years* and then initiating a lawsuit with no prior warning is not a good way to craft policy around an emerging market.

Especially because unlike many other crypto tokens, XRP has actually been *legitimately* used for cross-border payments as a bona fide currency. In "[I see you XRP](#)", a critical post I published three years before the SEC's enforcement action (and which would have protected investors from the 95%+ correction XRP had following my post), I outlined the issue:

"XRP could pick up steam as a viable potential "bridge currency." It could find footing as a reserve asset held by institutions who trade certain currency pairs infrequently, e.g. Tier 2 banks outside of the correspondent banking system who wish to settle local currency transactions. XRP "rewards" could be used as incentives to sweeten the pot, and lower the costs for the early partners. How does Bank A in Africa settle a debt denominated in pesos if they do business infrequently with Bank B in Latin America? Usually they go through another correspondent bank who uses a larger reserve currency to settle up — multiple hops to get to the same transfer, with each intermediary in the process taking a cut of the action. XRP could streamline that, early adopting banks could save money and win from being early to hold XRP, and the network could gradually decentralize. Not likely, but possible."



In the analysis, I didn't take issue with the company's use of XRP, but rather its selective disclosures around XRP sales, the lines it intentionally blurred during the promotion of its rising XRP volumes (which at the time were due to inflated/fake volumes on overseas exchanges), and its regular insinuations that new liquidity and buyer interest was coming from institutions vs. retail. It was sleazy marketing, and the company intentionally obfuscated (still does) all of its related party transactions and selling volumes associated with XRP. We followed the money and updated XRP's market cap accordingly, as we found [insiders were selling billions of dollars per year](#) in tokens that were otherwise already counted as part of the assets "circulating supply."

This is the case for the Safe Harbor in a nutshell: had Ripple complied with ongoing reporting under Commissioner Peirce's [draft proposal](#), this XRP supply asymmetry would have vanished:

*(iii)(D) Sufficient information for a third party to create a tool for verifying the transaction history of the Token (e.g., the blockchain or distributed ledger). **This would have ensured Ripple supported a freely available and forkable block explorer.***

*(v) Prior Token Sales. The date of sale, number of Tokens sold prior to filing a notice of reliance on the safe harbor, any limitations or restrictions on the transferability of Tokens sold, and the type and amount of consideration received. **This would have properly accounted for all of Ripple's historical sales, including lockups and discounts to business partners.***

*(vi)(B) The number of Tokens or rights to Tokens owned by each member of the Initial Development Team and a description of any limitations or restrictions on the transferability of Tokens held by such persons; **This would have tracked Chris Larsen's, Brad Garlinghouse's, and Jed McCaleb's ongoing sales, as well as those from the company's affiliated foundation.***

*(ix) Related Person Transactions. A description of any material transaction, or any proposed material transaction, in which the Initial Development Team is a participant and in which any Related Person had or will have a direct or indirect material interest. The description should identify the nature of the transaction, the Related Person, the basis on which the person is a Related Person, and the approximate value of the amount involved in the transaction. **Ditto.***

Under a Safe Harbor, Ripple would have had three years to figure out a distribution and decentralization strategy. That would have been pro-growth, pro-innovation policy. And the company either would have cleaned up its ongoing reporting, or Ripple and its executives would have faced an enforcement action - not for securities registration violations - but for fraud.

The policy goal for the safe harbor should be to weed out the fraudsters and con artists via opt-in transparency. Keep those involved in crypto who have earnest and laudable objectives, help foster safe innovation during the bootstrapping phase, encourage networks with tokens to decentralize, and pursue big ideas without tripping laws designed to protect investors. And most importantly, evolve the open standards much faster than would otherwise be possible with 80 year old securities laws from the *pre-computer* era.

I predict that the SEC will continue to be a drag on American crypto companies, things will get worse before they get better, and Gensler will continue to ignore Peirce's Safe Harbor proposal, so long as his master, Senator Warren tells him to.



12. The Battle for Privacy

It's sad, but our digital privacy rights are an afterthought to policy makers. They [take it as a given](#) that they will be able to snoop on our digital lives without limits under the banner of "national security" and "catching bad guys" and "collecting taxes." The worst parts of the Infrastructure Bill - the expansive "broker" language and the 6050i reporting provision - put the industry in an especially precarious position, probably violating both First and Fourth amendment rights, and will be challenged in court.

The "broker" language in the infrastructure bill is dangerously ambiguous. It could be applied to capture individuals who write code, validators who process transactions, and active crypto governance participants. The language was ostensibly written to ensure DeFi transactions could be monitored and taxable events reported to the IRS. But with Treasury seriously considering a wealth tax, the "ambiguity" seems more intentional. Again, recall that Treasury fought against the amendments the Crypto Coalition proposed as a fix.

The other big battle, of course, is with 6050i, which usually obligates businesses to file reports (including names and Social Security numbers) whenever they receive more than \$10,000 in cash from a counterparty. The infrastructure bill updated 6050i to include crypto reporting. According to the [Proof of Stake Alliance](#), who initially caught the provision, this new rule would go beyond the Bank Secrecy Act, by deputizing Americans to collect and report information on their fellow citizens the *government itself* wouldn't be able to access without a warrant!

As [Coin Center explains](#), the Bank Secrecy Act's reporting requirement is itself barely Constitutional, but only because

"banks are a third-party to the transactions of their customers. Bank users willingly hand transaction information over to a bank as a condition of using banking services and banks retain that information for legitimate business purposes. This is the essence of the so-called "third-party" doctrine which obviates the otherwise applicable Fourth Amendment warrant requirement."

In a peer-to-peer transaction, there is no third party. Yet under the new 6050i language, Alice and Bob could exchange BTC and ETH, and be subject to extensive reporting on each other. The extreme interpretation of 6050i in those cases would be that non-compliance could lead to a felony charge and up to five years in prison. That would effectively ban intermediary-less transactions, as it would make compliance in certain markets (NFT art sales) functionally impossible. Does that make us safe from the terrorists, yet, Daddy?

Both provisions are ripe for constitutional challenges if they aren't [amended outright](#).

13. Incorporating DAOs

The most clever policy proposal I've seen this year came from a16z. In their presentations to lawmakers and regulators, they start with the [why behind "Web3"](#) - user ownership promotes financial inclusion by making people owners and democratic voters in the platforms they use, it creates a pathway to open up big tech companies to competition, and it ensures the future of the internet will be open and free from corporate or authoritarian crackdowns.

It resonates. It also helps us push the focus beyond DeFi and cryptocurrencies, capturing things like non-fungible tokens (NFTs), internet connectivity, and data storage networks. The future of the internet itself.



But a16z also does something non-obvious and important: they remove the emphasis on tokens, and place it where it belongs: on DAOs as [a new legal structure](#).

Of course!

The trillion dollar questions for crypto are “how effectively can we decentralize” and “how well can we govern the open internet.”

Going back to the “Howey” securities test (an investment into a common enterprise with the expectation of profits based on the efforts of others), this is the very best way to limit jurisdictional overreach by the SEC and ensure tokenized networks can operate legally in the U.S. Cleanly defining DAOs as a new corporate primitive would serve the dual purpose of clarifying a) what constitutes a “common enterprise” and how to interpret the “efforts of others” in that enterprise, and b) how these legal structures can streamline global tax compliance. There are pretty obvious differences between companies and DAOs, and it starts with their fluid governance and legal structures, not their tokens.

This is the right path forward, but it also begs another question: if commodities have the CFTC, and currency has the OCC, and securities have the SEC, won't tokens still require a regulator?

Probably.

(Further reading: a16z [Win the Future, An Agenda for Policymakers](#), [Jesse Pollak's Note](#))



ZK Snarks vs Surveillance Capitalism
[View this NFT on OpenSea](#)

14. The American Web3 Council

Beyond stablecoin regulation, which should probably be handled by some combination of the OCC and FDIC (not the SEC), crypto is large enough, and transformative enough that it warrants its own regulator, as well as a self-regulatory body that might oversee crypto custodians and exchanges. Ironically, that regulator could look something like a combination of the OCC and FSOC.



Most of that regulator's focus might be on entities like Coinbase and Kraken and Anchorage and BlockFi that handle custody crypto for customers. But it could also help as a coordinating body with other agencies, break jurisdictional ties, and slam the door on attempted power grabs.

The American Web3 Council could run point on implementing things like Hester Peirce's Safe Harbor, handing fraud and cases of bona fide securities offerings over to the SEC. It could work with the CFTC on oversight of DeFi market makers and rules for the perpetuals markets. It could work with the IRS on tax reporting standards to fix crypto's 1099 problem. It could work with the IRS and others to create the new taxable legal structure for DAOs.

Most importantly, it could get ahead of new crypto policy priorities we haven't yet considered or haven't emerged: how do we tackle privacy, data permanence, IP, etc. on blockchains and in the metaverse. How do we treat liability and oversight in token-governed networks like DAOs?

Coinbase [proposed a dedicated regulator / SRO](#) combination in its recent policy proposals, and I think they articulated the [broad strokes well](#):

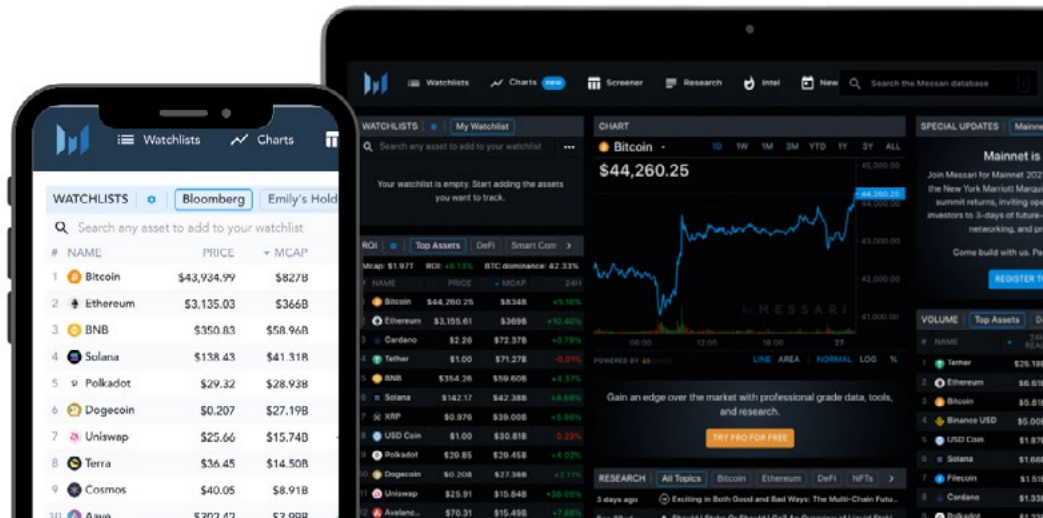
- Create a new framework around digital assets given their unique properties
- Assign a dedicated regulator to deal with the challenges of digital asset marketplaces
- Protect against fraud and market manipulation at these marketplaces
- Promote interoperability and competition



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The key here was Coinbase's inclusion of interoperability (a stand to protect wallet-to-wallet transfers and ensure "exit" from exchanges remains painless). Brian Brooks also suggested Congress apply a [non-discrimination principle](#) to crypto as well (no preferential treatment for TradFi vs. DeFi).

Something like the AW3C would present perhaps the only path forward that doesn't cede complete oversight of the crypto markets to the SEC, or push crypto offshore. There *will* be regulation, and Treasury and FSOC seem comfortable leaning heavily on Gensler. A *new* agency would highlight the U.S.'s embrace of crypto as a new paradigm (the internet treatment!), shepherd smart regulation, and help with tax guidance and compliance.

Unfortunately, I think this has a <0.1% chance of coming to fruition. Not with this gridlocked Congress and markets-hostile administration. Current regulatory leaders seem to have already carved up the pie for themselves.

My sense is that the future of American crypto relies on a [relentless legal assault on the SEC](#).

15. Local & Metaverse Battles

I had big plans for this section. Truly I did. Wyoming is doing great things, and innovating like crazy on [crypto banking structures](#) and [DAO governance rules](#). Mayors are starting to compete with each other to become crypto hubs: I like that NYC is [showing a little fight](#) and two of my other favorite cities - Austin and Miami - are already safe zones. I also truly believe that in a world where no unsettled physical land remains, we must turn our attention to virtual property rights. We should [fight for an open metaverse](#). In the physical and virtual realm we should be fighting battles at the decentralized edges.

But I'm going to stop here, for two reasons: 1) I'm tired and this section is long enough, and 2) I do not want to lose sight of my initial punch line. The fight is here, in America and in DC in particular, and the stakes couldn't be higher. We either win and realize another golden era of the user-owned internet. Or we lose, and the future looks bleaker.

States won't hide you from angry Uncle Sam. That's simply [not how it works](#). We must win DC.

16. There's Nothing More Punk Than the Battle for American Crypto

To close this section, I'm including an excerpt from a [recent thread from Punk6529](#). I'd encourage you to read all of [Punk6529's top threads](#) over the holidays. Between this report and Punk's missives, you're looking at a poor man's version of Crypto Federalist Papers.

"There is no more natural home for crypto than the United States of America. There is no more natural strategic weapon for the United States of America than crypto. The USA has never gone wrong betting on freedom and things are no different this time.

The USA has: the largest economy and financial markets, reserve currency, strongest military, largest tech industry, largest media industry (and more free speech than most), and an unending consumer market. It also has a fundamental belief in freedom from the state and a healthy distrust of the infallibility of the state: Boston Tea Party, Constitution,*



Bill of Rights. And the system of governance is also quite decentralized. The USA is a federation, something not fully understood outside the USA, with a massive number of states' rights.

My view is very simple: the USA can handle open systems, its strategic competitors can't. My view is the literal anti-Peter Thiel view. His view was that China was encouraging BTC to reduce USD dominance. It was the most backwards thing I have heard in years. The USD can handle BTC just fine. A closed system like the yuan cannot.

A different way to put it - I am much more optimistic than our political establishment. I believe the USA can lead the way to greater freedom, innovation and decentralization. And that will help the United States and the world. If the USA leads on this topic, the EU will follow. If the USA and the EU choose the path of freedom, we start to build systems that citizens of more closed systems to aspire to. This, to me, is the way.

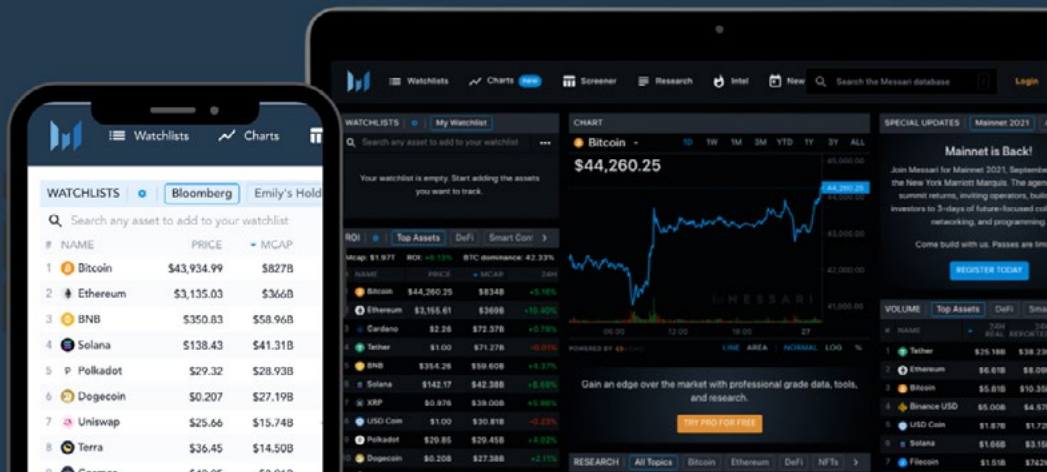
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Market Infrastructure

1. The Bitcoin Futures ETFs are State-Sponsored Pieces of Sh*t	75
2. Goldman Gary and the Reg M Redemption	76
3. Lender Reserves	79
4. CeFi vs. TradFi	80
5. CEX Ed	81
6. Crypto Securities (and ILOs)	82
7. Bagholders (and Stakers)	83
8. Coinlist: A Global Token Issuance Platform (Except in the US and North Korea)	83
9. RegTech	85
10. Payments Innovation	86
11. The National Security Case for Crypto Dollars	87
12. DCEP	88
13. Fedcoins & Western CFDCs	89
14. USDC & Brother Jeremy	89
15. When Paxos Met Novi	90



1. The Bitcoin Futures ETFs Are State-Sponsored Pieces of Sh*t

The Bitcoin *futures* ETFs that were approved in mid-October are terrible for non-Wall Street investors. Despite nominal fees of just 65-85 basis points, it's likely these toxic assets will cost investors closer to 5-10% / year in hidden costs due to their structures, bitcoin's ongoing volatility, and the market's long-term bullish trend. *Bloomberg* even went so far as to note that "[crypto's money printing machine has turned back on](#)" since funds like ProShares' BITO, Van Eck's XBTF and Valkyrie's BTF are required to "roll" the underlying bitcoin futures whose long-dated contracts have consistently traded at higher prices than short-dated contracts. That "[contango bleed](#)" accrues to Wall Street market makers at the direct expense of ETF holders.

Arthur Hayes [has a great post](#) on how these work in plain English.

This futures structure is arguably necessary for ETFs that track physical commodities like oil, where it's difficult or impossible to take physical delivery of the underlying assets (remember [last year's havoc](#) when oil futures went negative due to supply chain issues and storage costs?). But a similar structure is insane for an asset like bitcoin which has both a healthy spot market AND a simple mechanism through which investors can custody of physically settled futures: bitcoin wallets! We know from Day 1 that the new Bitcoin ETFs are losers. We need only look at similarly structured commodity ETFs to see how extreme the underperformance to spot is likely to get: the oil futures ETF USO is down 38% in the past five years compared to a 62% spike in the underlying asset.

Range	10/14/2016	-	10/14/2021	Period	Daily	No. of Period	1826 Day(s)	Table
Security	Currency	Price Change	Total Return	Difference				
1) USCRWTIC Index	USD	61.49%	61.49%	--				
2) CL1 Comdty	USD	61.49%	31.42%	-30.07%				
3) USO US Equity	USD	-37.93%	-37.93%	-99.42%				
4)								
5)								
6)								

(Source: Bloomberg, [Joe Orsini](#))

Raoul Pal [put it best](#): "Issuing the BTC futures ETF is a good step but it's basically handing hedge funds a massive arbitrage opportunity as the futures will trade at a large premium in bull phases and they get to capture those returns. This is the old financial market trick - you now have to add multiple new intermediaries who all make profits - the ETF provider, clearing house, futures broker, administrator, auditor, law firm, CME and hedge fund arbs. Wall street gets richer. Retail investors lose. Again."

If there is any silver lining here, it is (ironically) that Raoul is right.

Wall Street likes products that they can profit from, and a spot ETF, superior as it is, doesn't get those same juices flowing. Like piggies to a trough, could BITO et al finally get banks in on the crypto action? The basis trade presents free money they can pursue within their tight regulatory confines. I suppose this could be a long-term positive? In the meantime, if anyone aside from the brokers win, it will be [retail users at Coinbase](#), not BITO/BTF/XBTF losers.

[Ben Thompson also pointed out](#) that at least we now know the net cost of regulation: hundreds of millions of dollars worth of contango/backwardation costs for products that make no sense, other than that they are "regulatorily possible." The lower cost alternative to this madness, the spot ETFs are ones Gary Gensler is



unlikely to approve any time soon (see last Chapter), which is a perfect coda to a decade of blundering SEC crypto policy.

Public market investors missed 1000x of appreciation in the bitcoin markets since the Winklevoss twins first filed their spot ETF application in mid-2013. Now they can *also* lose 10% a year to Wall Street...with much lower upside. Investor protection, baby!

I predict that the headline costs to these products will all be sub 1%, but their costs net of contract roll will be >5% in 2022 (75% confidence).

2. Goldman Gary and the Reg M Redemption

One final reason Gary Gensler is a liar and a fraud when it comes to having any interest in protecting retail investors in the crypto markets has to do with Grayscale's Bitcoin Trust / GBTC product, which continues to be the most [misunderstood product in crypto](#).

I will do my best to briefly explain how it works, but the explanation could easily be 15 pages. The information about the trusts are all public, but you need to be sophisticated to even know what you're looking at in the filings.

First, you need to understand the org chart:

- GBTC is the public share float of the spot-based Grayscale Bitcoin Trust.
- The trust holds \$40 billion of bitcoin for a 2% annual fee.
- Grayscale is the sponsor of the trust and sponsors a family of similar trusts.
- Digital Currency Group is the parent company (100% owner) of Grayscale.

Then you need to understand the difference between Grayscale's products and a normal ETF.

A normal spot-based commodity ETF (like gold's GLD) has "authorized participants" (brokers) that create and redeem "baskets" of shares by trading the underlying assets and the shares they represent until price per share equals the underlying net asset value ("NAV"). If there's more demand for the ETF than the underlying intra-day, the share price > NAV dynamic attracts brokers to buy bitcoin, **create** new shares by sending that bitcoin to the trust vehicle, then sell the newly created shares on the open market. When share prices < NAV, the reverse happens, and the broker will buy shares to **redeem** them with the trust and get their bitcoin back. These creations and redemptions take place daily to ensure the market price of the ETF reflects the underlying assets less the sponsor's management fees.

The Grayscale trusts aren't like that.

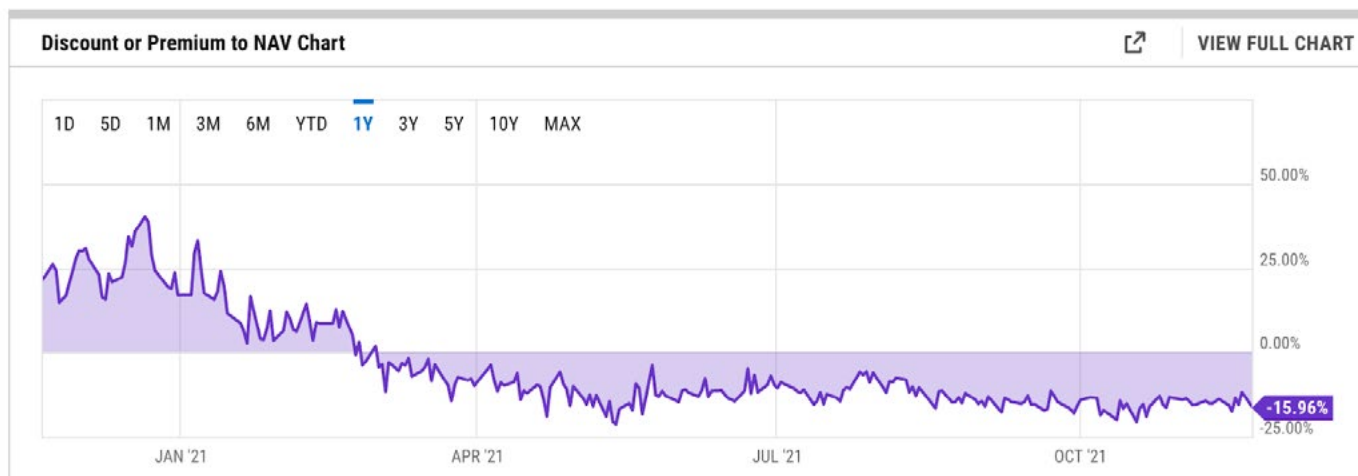
The GBTC shares you see today, have come to market through a loophole in securities law that allows Grayscale's authorized participant (yet another DCG affiliate, Genesis Global Trading) to raise money for its trusts from accredited investors, who can then flip the newly created GBTC shares on the public markets (OTC Markets, not NYSE) after a six month seasoning period through something called Rule 144. I've called this a quasi-ETF or side-door ETF or [Faustian Bargain](#) in the past. It *looks* like an ETF, but for the fact that 1) the public float hits the OTC markets in slow motion after the 6 month lag and 2) there's no redemption mechanism to get your bitcoin back by converting the underlying shares.

That last point is important as we'll see in a second. It's a one way funds flow.



The Rule 144 loophole paved the way for accredited investors to pile into Grayscale trusts early, then flip them to retail for mega-premiums after the lockup period. For a long time, demand for publicly traded bitcoin vehicles exceeded supply, and GBTC shares were the only game in town, while the SEC dragged its feet on other ETF proposals. This persistent public market premium was a great bootstrapping mechanism for Grayscale's trusts, and early investors made a staggering amount of money off the spread. Billions in total at the expense of retail and with the implicit blessing of the SEC.

The GBTC premium lasted a LOT longer than most people expected. But as bitcoin got much easier to access as an institutional investor, the overcrowded Grayscale trade flipped negative. Newly created shares flooded the market in Q1, and we now have a persistent, deep discount.



(Source: [ycharts](#))

Remember, if this were an actual ETF, the premium wouldn't have existed, and accredited investors wouldn't have been able to dump on retail investors for years. (Strike 1, SEC.) It would also mean that the trust's massive (and now likely permanent) discount to NAV would close overnight as investors would choose to redeem GBTC shares for bitcoin in the trust that are 15% more valuable in the spot market, and would rationally do so until the NAV gap closed. The Commission's refusal to approve a spot ETF continues to punish investors who are stuck waiting for a return to NAV that may never come, and must now eat an annual fee of 2% from Grayscale. (Strike 2, SEC.)

There is a third path and an escape hatch for Grayscale investors, though!

While Grayscale can't run a "continuous offering" of new shares AND offer a redemption program concurrently (they were [slapped for doing so in 2016](#) by...the SEC!!!), they can pursue something called Reg M redemptions now that they have paused new share creations amidst the GBTC discount.

The issue - and you're correct if you've anticipated a wild swing and a miss Strike 3 for the SEC here - is that Grayscale CAN pursue this at any time, but has no obligation to pursue Reg M redemptions, especially for as long as they are also pursuing an ETF conversion, which they did the second the futures-based ETFs were approved in October.

Grayscale is effectively saying a couple of things that are true, but not the whole truth: "we got in trouble for a Reg M redemption program in 2016, which is why we suspended it" and "liquidity is available for GBTC



investors in the public markets, and we are trying to close the NAV gap by converting the trust to an ETF.” Those are true, and they’re the party line, but the *whole truth* is that a redemption program is possible, but they choose not to pursue one.

Grayscale views their AUM as operating leverage vs. the SEC in its ETF conversion plot, but more importantly, they view it as a billion dollar guaranteed gravy train and permanent capital given the BIT’s current [Hotel California](#) structure. Grayscale as the BIT’s sponsor is the ultimate decision maker when it comes to whether they:

- file for an ETF conversion (they did)
- pursue a Reg M redemption program (they won’t)
- liquidates its trusts (yeah, right)

In the meantime, every DCG-Grayscale GBTC buyback isn’t an indication of confidence per se, so much as it is a money movement from one pocket to the other to avoid shareholder ire. They have no incentive whatsoever to allow redemptions.

Can you blame them?

The SEC is asleep at the wheel here, and Gensler is complicit in allowing the \$6-10 billion gap between GBTC and the trust’s NAV to persist. Grayscale “pursues” an ETF they know won’t come from this SEC with 0% urgency. “We won’t do redemptions until the SEC approves an ETF” is a smart hostage negotiation when they are dealing with an optics-oriented careerist like Gensler, who will face zero [critical backlash from the press for his stonewalling](#). This shit is too complicated to rile people up, so investors lose, while Gensler and Grayscale win.

That brings us to the frequent “news” this year from DCG, and their announcements regarding GBTC repurchase authorizations. (At writing, they had approved \$1 billion, though they had only executed ~\$400 million of transactions.) This isn’t heroism, it’s a riskless option.

Unwitting investors think DCG can close the NAV gap (impossible given the size of the trust), but what’s really happening is that either a) The ETF converts, and GBTC comes back to par, DCG realizes GBTC gains, b) the AUM sits there and DCG *pays itself* (through Grayscale) the 2% management fee on its GBTC shares, or c) they do finally roll out a Reg M redemption program or liquidate the BIT and get their bitcoin back at par.

After [I wrote about this last month](#), one lawyer pointed out that “these situations get into court all the time, definitely possible especially if Grayscale continues to collect fees while doing nothing about the discount. Remember they have a fiduciary duty to the trust.” Ok, fine, but remember they can argue that they ARE taking steps to close the gap via buybacks and the ETF application. They may be untouchable in that regard. But I think it’s fair for people to warn newer investors about the toxicity of Grayscale’s newer trusts, which tend to perform even worse.

Prediction: Barry Silbert is Gary Gensler’s Daddy. (100% confidence) Grayscale wins, and continues to make a mockery of the SEC. Investors lose as GBTC trades at an average 15%+ discount to NAV (75% confidence) with no Reg M program or ETF (95% confidence).

(Further evidence that Barry is a master at the secondary market and its information and legal asymmetries is DCG’s recent [\\$10 billion valuation](#), which feels like a 60-70% discount for a company throwing off nearly \$1 billion in annual EBITDA, with billions on its balance sheet.)



3. Lender Reserves

This hurts me to write, but stablecoin and lending product regulations would be a good thing for the industry. We sorta lost our high ground once we started to see some of the assets stablecoin issuers and lenders were warehousing on-balance sheet this year, including Grayscale shares!

Tether may hold too much commercial paper (see later this chapter), but BlockFi's assets might be more eye opening. I'll pick on them because a) I have assets there, so I think it's safe, b) they are in the [regulatory crosshairs already](#) (so they are relevant), c) they got caught with their pants down on a bad prop trade (so you can see this isn't just theoretical), d) they are very well-capitalized (so insolvency suggestions are not credible), e) this is all public information.

Here's what we know about BlockFi's Q1...

[The Block reported in January](#) that BlockFi was just shy of \$100mm in revenue in 2020, with ~\$30mm coming from GBTC premiums in the Grayscale trade and ~\$55mm from institutional lending. BlockFi was one of two firms (alongside Three Arrows Capital), who slammed the Grayscale trade hard enough to trigger 13G disclosures with the SEC. By February 11, BlockFi sat on [\\$1.7 billion of GBTC shares](#) and an unrealized ~\$150mm gain. Days later, GBTC prices began a two week 25% nuke vs. NAV. Whatever exact amount Blockfi failed to unwind during that time period immediately flipped to a \$100-150mm unrealized loss. Ouch.

The company announced a [\\$350mm Series D](#) just weeks later. Coincidence or solvency booster? I think the former, but the announcement certainly seems to have been fast-tracked.

Was BlockFi largely responsible for finally breaking the Grayscale trade? Well here's a plausible explanation for what happened in February:

As the GBTC premium narrowed, and opportunity costs rose, the BlockFi risk team would have naturally wanted to cut down the position. Given BlockFi's outsized exposure (remember, this liability would only GROW with an appreciating bitcoin price), unwinding their stake could have caused a vicious selloff below the NAV mendoza line, until the BlockFi risk team felt comfortable warehousing the remaining underwater position and implementing a strategy to write off the remainder of the bad investment.

Indeed, [by June 24](#), BlockFi had gotten out of ~45% of its position, which means they may still own upwards of a billion dollars worth of underwater GBTC, which they hold at a 10% unrealized loss, *plus* the 2% Grayscale management fee, *plus* BlockFi's depositor interest rates.

It's ok!

BlockFi will live, and their balance sheet can absorb the shock even if the position gets fully unwound at a loss. Perhaps BlockFi is already out of the trade entirely by now (I doubt it), and/or it has more than made up for the bad bet with its other DeFi bets and institutional lending. The fact remains, though, that it took financial disclosures on **third-party** filings to highlight that this was even a *potential* risk to what is now a \$10+ billion crypto lender with 500k retail clients. (It also highlights the challenge GBTC will face in rallying back to NAV. Whales will either eat the 2% fee and pray for an ETF approval, or sell bounces above, say, 90% of NAV.)

Now that we know about the sausage factory, it might be somewhat charitable to say that today's crypto lending products resemble money market funds - BlockFi's at least are much riskier - which doesn't make lending and stablecoin regulations look so crazy after all.



Matt Levine had the best write up on the issue with Coinbase Lend, and [nailed the punchline](#):

“Look, I get it. From the perspective of Coinbase, and of its customers, and frankly of most normal people interested in crypto: People would like to lend their Bitcoins. It doesn’t feel like a security. It’s kind of annoying and archaic that a 1946 Supreme Court case says that it is...[But also] this isn’t a stock or bond or “note” or “investment contract” or a personal IOU or syndicated loan. It’s a fully collateralized bank account with a 100% reserve ratio. Banks hold your money, use it to fund loans, pay you interest, pay you back even if the loans default, the whole thing is seamless to you, etc. It’s just a bank account.”

As I said in the last chapter, we have to hold the high ground! It’s a bit silly to warehouse a ton of risk on your balance sheet; that may cause major solvency issues; never disclose the composition of your reserves or lending book; and then expect no response from policymakers. We need proof of reserves for lenders and custodians.

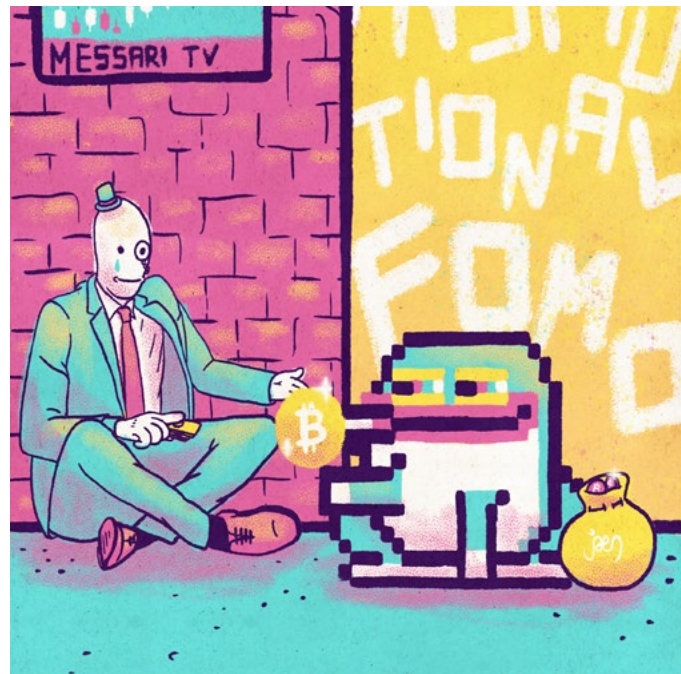
I think I covered this in the last section, but I think the crypto lenders will face tough regulations this year. The B2B desks (essentially securities lenders) will be just fine, but the retail lending players might not be welcome in the U.S. by year end.

4. CeFi vs. TradFi

I still don’t think people really get it. Banks, legacy trading desks, major asset managers... they can all enter crypto, and probably will sooner rather than later with a variety of offerings. But the game is basically over.

Short of indiscriminate crackdowns, record-setting M&A deals, or something similar, crypto’s “CeFi” firms have won, and will not cede their leads back to Wall Street. The same regulatory risks that loom over the industry keep TradFi organizations on the sideline, handicapping them from developing the institutional knowledge and human capital base to compete long term in regulated crypto financial services.

Sure, there will be corporate innovation groups, crypto executive officers, and press releases (god wait until you see the press releases!), but crypto companies are simply bigger, faster, more aggressive, and unshackled by the distractions of maintaining 50 year old parallel TradFi infrastructure. The talent pool only moves one direction, too...into crypto, where we’re still early in the multi-decade migration of financial, technical, and creative talent to crypto.



Institutional FOMO
[View this NFT on OpenSea](#)



Investors are not going to Goldman for OTC borrow before they go to Genesis, which has [originated \\$100 billion in loans](#) in less than 2.5 years. They aren't opting for CME over [Binance or FTX for futures](#). They aren't even looking at Fidelity before they look at [Coinbase Institutional](#) (which now counts 10 of the top 100 hedge funds as customers), and Fidelity is arguably best in class among legacy players when it comes to crypto innovation. The FDIC will use Anchorage to manage [orderly bank liquidations](#).

It's over.

We're not stuck waiting for the institutions to arrive, we're the barbarians at the gates eating all of their lunch. (Nom nom nom I write with satisfaction as I think of every slicked hair "blockchain not bitcoin" 2015-vintage banker with each one of my victorious keystrokes.)

(Message to TradFi insurgents: don't let my ribbing discourage you! it's still smart to help us bring crypto into your organizations! You'll be an internal hero, you'll get a big bonus, then you'll get a promotion - when you decide to leave and join a crypto company. Remember: you're auditioning for your next role in DeFi.)

5. CEX Ed

Decentralized exchange growth has been nuts. These protocols often offer a better user experience (asset coverage, accessibility) than their centralized counterparts, and they've done a good job in sopping up liquidity from global exchange also-rans (Chainalysis says [~200 CEX's shuttered](#) year over year down to ~650). The DEX momentum will persist for long-tail assets, and new synthetic instruments alike, as decentralized markets that build off of open source code will be broader and more dynamic than their centralized counterparts, by definition.

We have a whole chapter dedicated to DeFi, and we'll chat more about the DEX's in chapter 7. For now, we'll stick to crypto's mammoth centralized exchanges.

Today, there are basically three tiers. The top 3 "God tier" exchanges are Coinbase, Binance, and FTX, where primacy will likely come down to new products and regulatory wins. Then there's Kraken, Huobi, Kucoin, Gemini, OKEx, and Bitfinex in the "behind in volumes" camp, but "could still dominate" if any of the top 3 fall or stall. There will likely be a healthy dynamic among this group where market share ebbs and flows. There will also be regional winners: Upbit in Korea, bitFlyer in Japan, Bitso in LatAm, Coinswitch Kuber in India, Luno in Africa, etc.

I'm only going to cover the top three exchanges here. If that's disappointing, then you can write your own end of year book.

Coinbase has analyst coverage now, if you want to learn more about them in particular. I touched on some of their advantages in the Emilie Choi section, too. Staggering growth, first mover advantage, "free marketing" from their status as the first crypto IPO, liquid equity capital with which they can splash the pot on additional accretive acquisitions (they've proven to be highly lucrative given their installed user base), steadiest regulatory positioning out of the top exchanges today. But it's their Web3 initiatives that may be most interesting. I'm keeping an eye on their Coinbase Wallet and DAO plans, not to mention their upcoming NFT marketplace.

Binance is the most interesting player, not to mention the largest, out of the Big 3. It's arguably too big to fail, but they certainly have work cut out to clean up their regulatory image. They've been getting [chased around the world](#) for the past year or so, and CZ sounds like a guy who'd finally ready to settle down after a good run as a jurisdictional bachelor. My bet is that Binance probably [needs to take on a government as](#)



[an investor](#) at this point? Singapore, maybe? They are so large that regulatory remediations may need to happen via treaty vs. private negotiations. The regulatory hassles have kept the company's performance somewhat under the radar (if that's possible?) Everyone has been talking about Coinbase and FTX this year, while the BNB token, a shadow stake in just [20% of the exchange's profits](#)* crossed [\\$100 billion in market cap](#) for the first time this fall. (*Don't ackshually me. [I know.](#))

If you want to know where the puck is heading, though, I'll highlight FTX. A lot of ink has been spilt writing about Sam Bankman-Fried this year. [Chaotic good](#). Wealthiest person under 30. Effective altruist. [Sizechad impersonator](#). To be honest it's well-deserved. FTX moves at an otherworldly speed and has built a [\\$25 billion business](#) in less than three years with under 100 employees. They're the fastest growing company of all time, ahead of Coinbase, Stripe, and even Binance, and they did it in the ruthlessly competitive crypto exchange market. Here's how they did it in just 10 easy steps!

1. Leverage capital and street cred from being one of the top traders on BitMEX.
2. Make the markets during FTX's startup period with your sister prop desk.
3. Build [product for traders by traders](#) - things like leveraged tokens and tokenized stocks.
4. Use a token to incentivize early customer acquisition since switching costs are high.
5. Buy the largest mobile onboarding platform available in Blockfolio.
6. Become the second largest donor in the world to the future President's campaign.
7. Spend a staggering \$500mm on [sports marketing](#) to build brand awareness.
8. Pick the right Layer 1 blockchain to help scale a DeFi ecosystem around (Solana).
9. Use that to become a god for early bitcoiners to rally around outside of Ethereum.
10. Raise eye-popping amounts of money in [memeable increments](#).

If Web3 makes everyone an investor, then FTX et al wants to own the [internet scale exchange](#). At least one of them will realize that vision. By 2030, we'll see a trillion dollar crypto exchange.

(More required reading on Messari Pro: valuation models for [FTT](#), [BNB](#), [COIN](#))

6. Crypto Securities (and ILOs)

Still waiting for that rat, Gensler, to get his team to approve any of the crypto exchange's in-house ATS's rather than continuing to slander its applicants. In the meantime, there's only one "digital securities" platform worth noting, Republic Crypto.

Fresh off a \$150mm Series B, Republic looks interested in building a [secondary trading platform for digital securities](#), something that might become more widely interesting as private company valuation soar to record heights, and the accredited-only secondary trading process gets standardized. They're also worth watching as they may be a primary beneficiary in doomsday scenarios where most crypto projects are deemed securities. CEO Kendrick Nguyen hasn't shied away from that reality: *"everything that Republic does, everything we touch, we treat them as securities by and large and fit them under the existing framework of U.S securities law."*

Still, it's another new Republic product that I'm more interested in: [initial litigation offerings](#). If the threat to crypto comes primarily from FSOC regulators, then creating a fund to relentlessly counterattack via lawsuits may be a more productive use of capital than campaign financing.



7. Bagholders (and Stakers)

Custody is where the rubber meets the road between crypto and TradFi. Taking custody of customer funds opens the door for staking, lending, market-making, governance participation, and more. It's the one obvious area that crypto companies should be (and are) regulated. Most of the M&A activity we'll see among TradFi entrants to crypto in the coming years will be in custody, and most of the investors and network participants we'll see enter the crypto economy will choose hosted custody over self-custody for safety and security.

Dedicated custodians like Anchorage, BitGo, Fireblocks, and Ledger have all recently hit unicorn status as traditional fund interest has exploded. Coinbase Cloud (the Bison Trails infrastructure) shows how insanely lucrative the hosted node and staking services market is for these groups. They raked in \$80 million in Q3 staking revenue alone, and other infrastructure companies like Blockdaemon, Figment, and Alchemy have raised massive sums to follow suit.

The risks of concentrated custody are lower than they may appear at first glance. Coinbase holds 10% of all outstanding bitcoin, but half of that is due to its role as Grayscale's Bitcoin Trust custodian. By comparison, Ledger is estimated to "hold" 15% of all crypto. So the assets under self-custody via *one* company's hardware wallets, eclipses the largest centralized exchange's assets under custody by a fair margin. At scale, I guess we'll probably see a 50-50 split, where savers keep large investments in custodial or semi-custodial (multi-sig) accounts, and retain ownership over their more dynamic liquid holdings in something resembling a checking account.

8. Coinlist: A Global Token Issuance Platform (Except in the US and North Korea)

I know you're thinking "stop, stop he's already dead" when it comes to Gary Gensler and his SEC, but I'm going to continue my assault until he and his minions stop attacking innovators in crypto, and tell the truth about the underlying market. They've crossed a line from being naive to intentionally misleading, and someone needs to call out the lies.

Up next: ICOs, and their historical performance.

Commissioner Caroline Crenshaw actively campaigned against the [Peirce Safe Harbor recently](#). She claimed that the 2017 ICO euphoria would have been "even worse" if a Safe Harbor had been in effect. "ICO's and other digital asset offerings raised billions from investors, but most never delivered on their promises," she warned without evidence. Let's give her the benefit of the doubt, though. It's a sensible thesis as most startups also fail.

How did the market do as a whole?

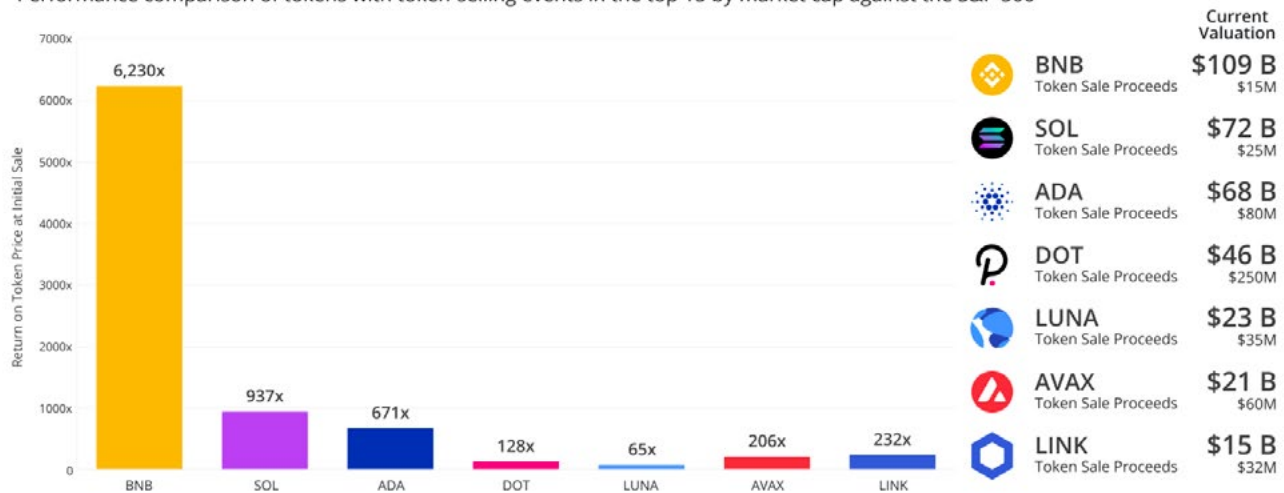
Well, token sales have actually performed better as a class of investment than the S&P - by more than an order of magnitude. Token sales have raised about \$20 billion all time. Binance (BNB) alone has delivered a 5x on that entire initial investment. Here's the actual math, for the seven token selling projects in the top 15 by market cap.





Investment Performance of Top 15 Tokens with Selling Events

Performance comparison of tokens with token-selling events in the top 15 by market cap against the S&P 500



Data as of: Nov. 28, 2021

Source: Messari

That's \$350 billion of value creation on just \$500mm of invested capital...more than enough to offset all the losers nearly 20x over by themselves. And that excludes Ethereum's \$550 billion of market value created on just \$18mm in crowdsale proceeds in 2014. For the token sales that underperformed and/or didn't deliver at all and/or were complete scams, a good Safe Harbor would have turned these tenuous "unregistered securities" cases into slam dunk fraud cases.

It's nonsense to claim that tokens as a class have been bad for investors. If anything, they serve as an indictment of the SEC. Investors want and need alternatives to today's stock market. Participation in the token economy - with just about any level of diversification - has historically minted winners. Take Mason's [recent analysis of CoinList sales](#), which also makes a mockery of Crenshaw's claims. While the US is listed next to North Korea in the list of excluded countries for participation in most of Coinlist's sales, here's how \$100 invested across each of their first 20 sales would have actually performed:



Coinlist Auctions Vs ETH Performance

Coinlist sale returns

Token	CoinList Sale Date	Return Since Coinlist Sale	ETH Return	ETH or Coinlist
Solana	May-20	60425%	1218%	Coinlist
Flow	Sep-20	9346%	541%	Coinlist
Filecoin	Aug-17	6064%	1195%	Coinlist
Near	Aug-20	1838%	658%	Coinlist
Mina	Apr-21	1474%	43%	Coinlist
Internet Computer	Jun-18	910%	377%	Coinlist
Blockstack	Dec-17	556%	517%	Coinlist
Celo	Aug-20	462%	658%	ETH
Origin	Jun-18	407%	377%	Coinlist
Ocean	Feb-19	402%	2463%	ETH
Casper	Mar-21	339%	90%	Coinlist
Efinity	Jun-21	283%	7%	Coinlist
Centrifuge	May-21	275%	-427%	Coinlist
Covalent	Apr-21	185%	43%	Coinlist
Kadena	Mar-20	109%	1115%	ETH
Vega Protocol	Jun-21	102%	7%	Coinlist
Swarm	Jun-21	65%	7%	Coinlist
Human	Jun-21	54%	7%	Coinlist
Nervos	Oct-19	21%	1461%	ETH
Algorand	Jun-19	-34%	948%	ETH
Props	Dec-17	-88%	517%	ETH

Data as of: Sept 29, 2021
Source: Coinlist

(Source: [Messari Pro: CoinList Sales vs. ETH](#))

The only question in this analysis was whether Coinlist investments outperformed ETH as an investment, not whether it delivered a positive return. In the period evaluated, only two tokens were trading under the Coinlist selling price. One of them, Props, was effectively destroyed as their decision to comply with SEC reporting and securities restrictions under Reg A made their network unusable. The other came with an embedded put option for Coinlist buyers. If you had invested blindly with \$100 across each Coinlist sale, you'd have deployed \$2,000 and returned \$150,000 with a 100% hit rate aside from the SEC-sanctioned project.

It's disgusting, and current SEC leadership deserves your wrath.

To add insult to injury, Coinlist, which was spun out of Angellist, a company that helped author the JOBS Act in an attempt to loosen existing securities laws, recently raised [\\$100 million at a \\$1.5 billion valuation](#) despite being unable to sell to US investors.

The infrastructure is there to facilitate compliant, user-friendly, fair, long-term oriented, network decentralizing token sales on American platforms. The SEC is just grossly negligent.

9. RegTech

If you want to enter the crypto fray as an investor or contributor, but also want to feel like you're a sheriff in the Wild West working to bring order to the frontier, then crypto's regtech plays are a good place to start. Crypto's RegTech leaders are the frontlines of our defense, and they are very often a bridge to the more reasonable, good-faith regulators on the other side of the aisle. (Remember, a16z's Katie Haun was a federal prosecutor before she joined Coinbase's board!)



Public blockchains are open to inspection by their nature, so it's a good thing that these companies help authorities ([with probable cause](#)) nab money launderers, tax evaders, and terrorists. Strong compliance tools help bring credibility to our claims that public blockchains make cryptocurrencies *terrible* vehicles for crime. They are FUD busters.

It was, indeed, a banner year for AML solutions like Chainalysis (\$100mm from Coatue, Benchmark, Accel at a [\\$4 billion valuation](#)), Elliptic (\$60mm from [Evolution and Softbank](#)), and Ciphertrace (\$27mm from [ThirdPoint](#)). Same with tax solutions, as TaxBit leapt into the unicorn club (\$130mm from [Paradigm, Insight, and Tiger Global](#)). Crypto data and governance platform, SEC killer, and superhero factory, Messari also had a good year (raised \$21mm from [Point72 Ventures](#) and all of the major US crypto exchanges).

You don't need to be a complete renegade to have some fun building in crypto.

(Btw, we're hiring for dozens of open roles. If you're a developer that likes data infrastructure and DAO governance tools, and you want to stick it to the SEC, you should check out our [careers page](#). We also made CB Insights [Fintech 250](#), one of the only non-unicorns to make it on the list...you know what that means.)

10. Payments Innovation

Once again, this section in and of itself, could be a full report. I am going to leave a lot out, or kick it down a level to the stablecoins section for further color where appropriate.

To me, the most exciting trends in crypto payments are probably obvious. Stablecoins have exploded. Settlement volumes on both bitcoin and ethereum are up by multiple orders of magnitude in the past couple of years. And every time I send a USDC payment to fund an investment, I weep tears of joy that I don't have to initiate a wire on a banking interface that looks like it was designed by someone who still plays Frogger in their spare time.

These are obvious. I'd rather talk about all the unique upgrades we've seen so far this year: in payroll integrations, "superfluid" streaming payments, quadratic payouts, and integrations with new customers like charities, etc. I'm going to shill my angel bags here, because none of these companies have tokens, and they're all killer payments infrastructure businesses that have seen volumes go vertical this year:

Payroll ([Juno](#)): I have been banging the drum about the need for crypto payroll solutions *for years*. Tools that streamline the integrations with big payroll providers and make it seamless for employees to receive crypto as salary while also satisfying tax compliance needs. We're using Juno for our crypto payroll, and I even recommended it [to the Miami mayor](#). (How's that for investor value add? ;))

Streaming Payments ([Superfluid](#)): I. Love. Streaming. Payments. Back in 2015, we were the first investors in Streamium, a bitcoin streaming payments company that worked sort of like lightning before lightning network (Streamium pivoted and became OpenZeppelin). On bitcoin today, a similar solution exists with [Strike](#). But I'm most interested in streaming payments options on Ethereum. Superfluid can handle subscriptions, salaries, rewards or any other stream of value, with continuous, real-time settlement. Multicoins calls it [Networked Cash Flow](#).

Quadratic payments ([Gitcoin](#)): Ok, Gitcoin has a token, and I was (unfortunately) not an early angel investor. But they are the first major project to incorporate [quadratic payments](#), which is a killer crypto primitive. Gitcoin powers "public goods" funding programs that are scaleable (communities



vote on proposals vs. committees), open for debate, and democratic without being plutocratic. This is how DAO treasuries will ultimately get unlocked effectively at scale.

Charitable giving ([The Giving Block](#)): Before crypto, I started a charitable payments company. When I first entered the space, I thought about pivoting the concept to apply to crypto assets. It was too early, but my thesis remained intact: donating appreciated crypto assets offer gives a double benefit: you avoid capital gains taxes on the donated "property", and you get to write off the full liquid value of the gift. The Giving Block has *crushed it* this year by bringing this idea mainstream. They'll process \$100mm+ in donations, and are [just getting started](#).

Emerging-markets ([Valiu](#)): We still take stable currencies for granted in most of the developed world. That may be slowly changing with inflation at 6%, but it has been a fact of life for those in emerging markets like Venezuela, who have experienced catastrophic currency crises and political upheaval. I'd like to continue betting on the top remittance platforms that bring payment stability to crisis areas, regardless of their physical location using stablecoins.

Again, I'm not doing justice to everything that has happened this year in crypto payments. It's just too big. Coinbase announced a partnership with Visa and rolled out its Coinbase Card. BlockFi announced a bitcoin rewards credit card. Stripe is [hiring a crypto team](#) and added Paradigm co-founder Matt Huang to its board. Mastercard [partnered with Bakkt](#). Visa leaned into the punk rock ethos by [buying a Punk](#). Ramp raised [at \\$300 million](#). Moonpay [raised at \\$3.4bn+](#). It's all too bullish. I can't take it.

Don't miss your chance to own one of Messari's first NFTs from the "Messari 2022 Theses" collection. Each unique piece of crypto art tells the story of the year behind us, and the year ahead.

Check out the full collection designed by pop surrealist artist Jean on OpenSea.



11. The National Security Case for Crypto Dollars

One of the things that got me into bitcoin in 2013 was a "Big Short" thesis on U.S. Government competence. I thought our national leadership -- largely due to the accelerating degradation of our two party system and media -- would lack the capacity to address structural challenges in any meaningful way, and that even if they did, they would do so with the efficiency of drunks.

That thesis has been proven largely correct. Political polarization has gotten much worse, deficits are at World War II levels (because no one can agree on a responsible budget), and with interest rates near zero, we've opted to monetize our debts at a massive scale. Some 40% of USD that has ever entered circulation was [printed since the beginning of 2020](#). All that has led to the 500x+ return on my initial short thesis via a bitcoin long.



So it may surprise you to know that I am actually very long the US Dollar for national security reasons, and because I happen to like this country, even if I resent many of its leaders. Namely, I believe one of the only ways out of our current mess is to leverage the remaining time we have wielding the globe's dominant reserve currency, and begin to export crypto dollars. A digital cash instrument that has the full faith and credit of the US Treasury, but can trade pseudonymously (auditable supply) would be amazing, and attract global counterparties. A closed loop Federal-Reserve maintained central bank digital currency (dystopian overreach) would likely fail, as no nation-state in its right mind would invite that sort of granular foreign oversight into its banking system.

Why should policymakers embrace responsibly regulated stablecoins? a16z put it best:

"The existing, thriving ecosystem of private USD-denominated stablecoins can help the U.S. act quickly to win the emerging geopolitical arms race in financial innovation. The United States should condemn the surveillance authoritarianism embodied in China's digital renminbi project--not attempt to imitate it. American policymakers should be cautious about building massive, centralized payments infrastructure. Doing so would impose unprecedented demands on the government's limited capacity to stand up critical technology platforms, present significant privacy risks, and create an immensely attractive target for attackers."

Regulated stablecoins can coexist with more limited CBDCs, and add resilience to our future financial system, by removing a single point of failure.

I agree, and I believe the [only path to keeping the USD as the world's preferred reserve](#) currency is for the US to embrace crypto. As bitcoin's liquidity increases and financial institutions and foreign governments hedge against US creditworthiness, we could see bitcoin and other forms of crypto replace their reserves vs. Treasuries. Or we'll see central-bank digital currencies with strong monetary policy guarantees more easily chip away at the USD lead. The game theory here is for the US to ban its alternative, or buy in as a liferaft.

The former won't work for long. The latter must.

12. DCEP

To be perfectly honest with you, I have spent approximately 15 minutes reading up on central-bank digital currencies this year. I read and heard what I needed to several years ago, when the concept was first introduced and ever since, every headline I've seen essentially boils down to "wow! this is great! we can fully surveill citizens' financial transactions and [bring rates negative when needed!](#)" No me gusta.

China's DCEP offers a special sort of hellscape (social credit scores ftw!), and you'll notice this is one of the only times I'm referencing them in this report because otherwise, I don't view anything crypto-related in China as interesting. (I would also like to not be imprisoned if I ever travel to Hong Kong again, so better to stay relatively mum on Chinese geopolitics.)

China is going to [roll out its DCEP in time for the Winter Olympics](#) in a few months, and my fear is that the major Western governments will view the rollout as an incredible success and attempt to emulate the new product as quickly as they can. They will fail of course, because those with the technical acumen to pull a project like this off (Facebook's Meta's Libra Novi), are reviled by our government leaders vs. aligned and partnered with them.



DCEP - as with all CCP crypto policy - is ultimately designed to eliminate leaks in the country's capital controls. One analyst says [DCEP will reduce](#) capital flight to Macau by \$600 billion.

My biggest fear is that this is just step one in a long-term move to displace the dollar as an exportable reserve currency. If China is able to create a two-tiered DCEP payment system - one that facilitates pseudonymous circulation abroad and fully-surveillable transaction monitoring at home, it would function similarly to something like ZCash. Only rather than a [shielded pool of z-addresses](#) and transparent pool of t-addresses, you could have two transparent pools of RMB: a foreign pool with surveillance at the point of interaction with the Chinese state, and a *fully-unshieldable* pool of domestic RMB, where CCP authorities hold the second keys.

In other words, DCEP could soon be the leading digital eurodollar candidate. China is now the primary trading partner for most countries, [including the EU](#). If they offer even a small degree of privacy in a foreign circulating digital yuan, it could be a [real threat to USD's reserve paradigm](#).

13. Fedcoins & Western CFDCs

It's natural that the West is feeling the pressure to act. The Federal Reserve will "soon" release a report examining the [costs and benefits of its own CBDC](#). Fortunately, this is a race that we're going to lose. And frankly, we should lose.

The trajectory we are on in the US (and Europe) includes state-run digital currency payment rails that would allow for ubiquitous transaction surveillance, censorship, and negative interest rates that steal deposits as a mechanism to enforce wealth taxes or punish savers in periods of sluggish spending. We're trying to build a shittier version of China's DCEP, but without the requisite authoritarian values to pull it off in the West.

We'd have no competitive advantages - they would move faster, with better coordination and enforceability of adoption, and start with a larger trade network. Our only interesting advantages (respect for privacy, openness, a commitment to rule of law, etc.) would be more or less absent from a CBDC design, while a CBDC would further [deputize our payments companies](#) to surveil customers, even as it threatens to [disintermediate them](#).

Snowden calls them [CFDCs](#) (the "f" is for "fascist"), and I like that framing. Modern governments have not been good stewards of the public's trust. It would be insane not to fight their efforts to install themselves into 50% of all transactions. Especially when the government (subject to court checks and balances) can already act as an effective 2-of-3 multi-sig signer in modern bank accounts, and even more especially when better alternatives are already present.

During [testimony before the Senate Banking Committee](#), Fed Chairman Jerome Powell seems to agree! He told the committee he remained "[legitimately undecided](#)" as to whether the benefits of a CBDC would outweigh its potential risks, and offered that a better solution might simply involve the cleaner regulation of stablecoins.

14. USDC & Brother Jeremy

When I started writing this report, I didn't have "Jeremy Allaire may be the world's savior" in my outline. But hear me out. Actually, go [watch Jeremy rap first](#). Then hear me out.

The "Jeremy as crypto dollar Jesus" thesis in four parts:



1. We should rally around liquid, well-regulated stablecoins that are integrated across the crypto ecosystem, and Circle's USDC and Paxos are the only serious contenders today.
2. USDC is the only stablecoin interoperable already between Binance, Coinbase, and Kraken (and Huobi and OKEx), and it is [a stronger DeFi bridge vs. Paxos](#). To absorb marketshare from Tether, the winning stablecoin must be ubiquitous, and USDC is an [order of magnitude larger](#) than Paxos.
3. Our alternatives as a country are to watch DCEP replace the dollar as global reserve, outcompete China with our own full-surveillance currency (I don't predict a kind public response!), or rally around fully-reserved, well-regulated stablecoins.
4. If the dollar loses its reserve currency status, it will be very bad for global geopolitics. I'm not sure such an epic transition of power would be peaceful.

Doesn't sound so crazy anymore!

There's a lot to like about USDC. It's already multi-chain, accessible on Ethereum (and its Layer 2s), Solana, Algorand and more. It's the most liquid stablecoin in DeFi. Circle releases monthly [audited reports of USDC reserves](#) from top five auditor Grant Thornton. USDC's creators (Circle and Coinbase) have street cred, having worked feverishly on building compliant crypto payments infrastructure since 2012. Circle may also benefit from the public company halo effect once it [lists via SPAC](#), and adds nearly \$500 million in additional cash to its balance sheet.

If financial inclusion and humanitarian aid is at all a priority for this administration, Circle has also done some legwork there already...[with the US government](#)! USDC is one of the most promising currencies that balances broad, affordable payment access to underserved communities and legal and regulatory compliance.

15. When Paxos Met Novi

Paxos has emerged as the backbone for institutional entrance into the stablecoin market. If regulators think Circle is playing too fast and loose in DeFi, there's always an alternative. This year, Paxos deepened its partnership with PayPal by [integrating with Venmo](#), they teamed up [with Mastercard](#), they began powering [crypto trading on Interactive Brokers](#). And then there was the real prize: the Guatemalan pilot launch with [Facebook's Novi wallet](#).

Even if Novi plans to eventually move over to its "Diem" currency - that process may take years and is by no means guaranteed - Paxos USDP could explode in size and volumes in the meantime as Novi marches against an ambitious roadmap, one that could have an immediate [disruptive impact on less scrupulous](#) financial services providers.

As I wrote last year, *"the U.S. will have a proliferation of non-bank financial crypto dollars*

years before we ever see an iota of progress on a similar scale central-bank digital currency." We will win if we continue to lean into that lead, especially since stablecoins are, in many ways, the perfect reflection of our inability to innovate within the regulated financial system: the byproduct of our ["original sin"](#) excluding crypto companies from banking services.

If you still doubt that regulated stablecoins are our future, then you have a homework assignment: send one wire and one stablecoin transaction this week.



NFTs & Web 3 Plumbing

1. NFTs: Digital Goods on a Global Ledger	92
2. A \$69 Million Mona Lisa JPEG	94
3. PFPs: Punks vs. Apes	96
4. Fan Tokens	99
5. Axie Infinity & the Play-to-Earn Revolution	101
6. Looted: Composable NFTs	103
7. NFT Financialization	105
8. OpenSea & Friends	106
9. The Cryptoverse	107
10. I Said Metaverse, Not Meta	109
11. Non-Fungible Credentials	110
12. Namespaces & Data Sharing	110
13. DeSo Lotteries	111
14. The Physically Decentralized (Permanent) Web	112
15. Physical Network Scaling	113



Get used to hearing the term “Web3” because it could eventually replace “crypto” as the go to moniker for the decentralized tech movement. It [plays better to new audiences](#), it’s [less scary sounding to regulators](#), and it’s a faster and more accurate meme.

Mason [defined Web3](#) as the “paradigm shift towards a more democratized Internet” governed by the collective. Chris Dixon [says Web3](#) gives us “the chance to upgrade networks into crypto asset centered economies, and build systems where the incentives of network owners, network participants, and third-party developers are fully aligned.” I like those definitions. Rearchitecting internet services and products so they benefit users rather than gatekeepers is a clear and urgent mission, and Web3 accurately captures the breadth of what we’re attempting to (re)build.

For that reason, I’m starting the second half of this report with a section on: the Web3 apps that exploded onto the scene in 2021, non-fungible tokens (“NFTs”); the networks with likely 2022 breakout potential (play-to-earn games and decentralized social networks); and an overview of the physical plumbing of our future metaverse.

In investing, there’s a saying that “early = wrong”, which is why it’s important to drill down on the sequential buildout of Web3 and see whether now is actually the time some of these networks might finally come to fruition and win big.

[Linda](#) and [Rhys](#) seem to have similar mental models that match mine:

The 2020 DeFi boom supplied the “throughput infrastructure” of self-custodied, permissionless trading (like routing and bandwidth in Web1), which allowed NFTs to take off. The explosion of demand for NFTs (plus DeFi) pulled forward demand for more scalable Layer 1 and Layer 2 blockchains earlier this year. All of *that* will spur growth in DAO infrastructure in the new year: NFTs provide on-chain identity and reputation for DAO contributors; DeFi gives DAO members massive liquid pools of capital to govern; and scaling solutions will make on-chain governance economically feasible.

In Web3, cryptocurrencies (Chapter 3) and NFTs (Chapter 6) are the digital goods of the new economy, DeFi (Chapter 7) is the native financial system, Layer 1 networks (Chapter 8) are the rails that power everything, and DAOs (Chapter 9) are how the frontier gets governed.

It’s all coming together, and it’s going to be absolutely beautiful.

1. NFTs: Digital Goods on a Global Ledger

Let’s start with the breakout asset class of the year: NFTs. Yes, they’re like the ICOs of this cycle: sky high hype, crazy volatility, lots of early lottery winners and complete garbage. But as a new asset type and class, they will transform the world.

NFTs are cool because they represent verifiably scarce, portable, and programmable pieces of digital property. An NFT could be a share of stock, a virtual sword in a MMORPG, a profile picture on social media, a new digital art piece, a plot of land in the metaverse, or your data record on Facebook. The potential for NFTs is essentially unlimited as blockchains become global transaction ledgers for both natively virtual property and physical property (or at least, their digital receipts).

The “real world” version of an NFT might be something like the deed to my house (verifiably scarce), if I could prove ownership to my insurance company by signing a transaction in a wallet that holds the *receipt* of my deed (digital representation of property). I could grant access to the house for Airbnb guests with the NFT (programmable), or I could take out a home equity line of credit and pledge the NFT as collateral on a peer-to-peer lending platform (portable).



That comes later. The toy version will come first:

I sign into a VR casino with my virtual ID (verifiably scarce) and pull up a chair where the dealer recognizes my avatar as TBI (digital representation of property). Since this is my 10th time at the casino, and I've been on a heater, my player's card is [shining hot](#) (programmable), signaling that other players should come join my table, which the casino likes and decides to send me a virtual "drink ticket", that can be redeemed at Uber Eats, Drizzly, or any app that recognizes those NFTs are credits (portable).

If you have a little imagination, you'll see that the opportunity is [ginormous](#).

I'd encourage you to watch these two ten minute explainer videos if you want a good visual primer on [how NFTs work](#), and why [we've recently hit euphoria](#). It will set up the rest of this section, so it's ok to take a break from reading. We're on page [100] now, so I'll allow it.

Welcome back! I hope you've been redpilled. Especially since NFTs are so intuitive, [even the NY Times gets them](#). Here's Ezra Klein in an op-ed this summer:

"Think about it this way: The internet we have allows for the easy transfer of information. We costlessly swap copies of news articles, music files, video games, pornography, GIFs, tweets and much more. The internet is, famously, good at making information nearly free. But for precisely that reason, it is terrible at making information expensive, which it sometimes needs to be. What the internet is missing, in particular, are ways to verify identity, ownership and authenticity — the exact things that make it possible for creators to get paid for their work."

If a big part of our future lives are spent living in global, virtual, interconnected worlds (the metaverse), then NFTs are some of the primary building blocks for everything in that world. You don't want to live in a virtual world where your entire identity is at the mercy of a Big Tech cancellation tribunal. This is intuitive if you've ever switched social media platforms and had to build back an audience and reputation from zero. Or if you've ever purchased virtual goods in a game, but then realized that the gamemaker controls all of the trading rules, and you can't sell the goods you've earned or take them elsewhere. Or if you're a believer in VR, but shudder at the prospect of getting unpersoned in Mark Zuckerberg's Meta dystopia (more later).

NFTs can, should, and will transcend their underlying blockchains and metaverses.

You also don't want to live in a virtual world where everyone looks the same, and there is no recourse for identity theft. So you need *some* third parties. To avoid "sameness" you need scarce digital objects which have real value, and you'll likely be willing to pay talented creators for provably unique goods.

For illustration, take the case of 1,000 unique South Park Avatars available to mint for 1 ETH each. You'd be able to send ETH to the SPA NFT contract, and mint a new cousin for Cartman and TBI, but *only if* the contract state reflects that fewer than 1,000 avatars have been minted so far. Thanks to the ERC-721 standard, these little South Park misfits could function the same way as any other NFTs trading on that standard on the Ethereum blockchain.

That's a 100x improvement over how most virtual goods are bought today - through centralized, siloed platforms like gaming giants where scarcity is in the eye of the gamemaker alone. Contrast that with NFTs, which 1) connect users to a universe of creators 2) for lower fees while 3) giving both parties provable ownership of their virtual assets across 4) any platform that trusts the blockchain. In many cases, the assets themselves can [even evolve over time](#).



This is true whether we're talking about digital art, digital identity, community memberships, gaming goods, or financial assets.

It's not about *individual* assets, bruh. Almost all of the [smart folks in crypto](#) agree that *most* NFTs will go the way of *most* 2017 ICOs...to zero.

But *some* early projects will succeed at tremendous scale, and the asset class as a whole will explode over the next decade. NFTs will impact [every sector of the economy](#) and kids will own more stuff that "[look like NFTs than physical items](#)." You *must* understand the impact NFTs will have by 2040 even if you don't care about them today.

Let's start looking into the future of NFTs, brick by virtual brick.

(Other NFT primers: [*Two Hour* Must Read](#), [Exploring the NFT Stack](#), [NFT Q2 Report](#))

2. A \$69 Million Mona Lisa JPEG

Regardless of whether you are bullish on NFTs as transformative new technology, you might be aghast that people have been spending millions of dollars on "jpegs."

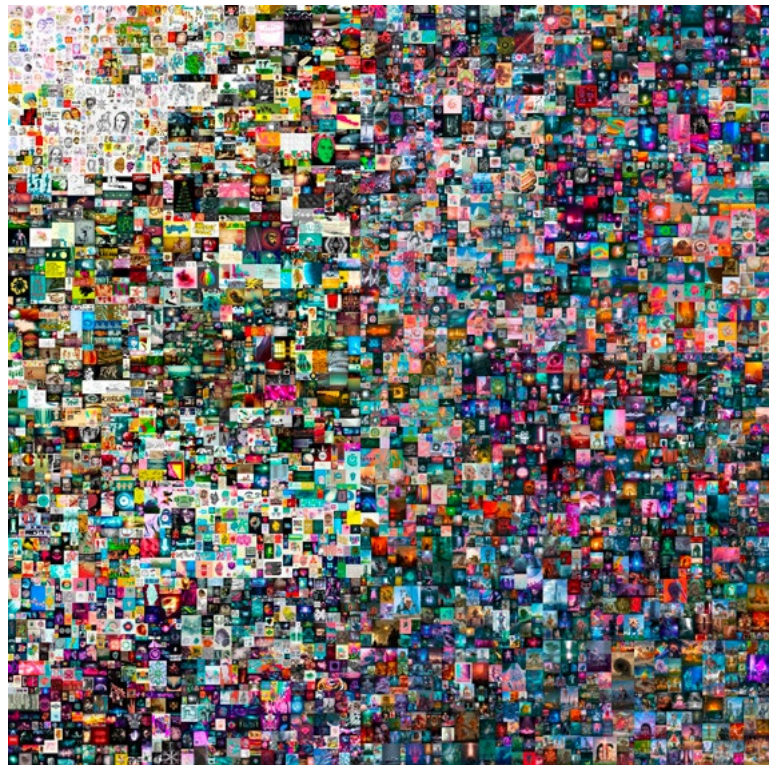
To understand why that's not *completely* crazy, we should start with the most famous piece of art in history, Da Vinci's *Mona Lisa*, and consider its "fundamentals" - its history, rarity, memetic value, the artist's reputation, and the underlying market dynamics of the physical asset.

Sure, the *Mona Lisa* is the most iconic piece from the most famous artist of all time, and was acclaimed for its uniqueness even among Da Vinci's contemporaries.

More importantly, though, it has a number of "[off-chain](#)" attributes that make it pop. Its home is the world's most famous museum, the Louvre. It was the target of the most famous art theft of all time. It's become a meme and fixture of pop culture in and of itself due to its simplicity and that mysterious smile. *Other people* want to take their picture with the *Mona Lisa* to collect a social media travel merit badge. And as the most famous attraction in the Louvre, it's arguably a capital asset, too! The *Mona Lisa* sparks tens of millions of dollars per year in tourist revenue.*

In short, it's a cool painting with a cooler backstory.

Know of anything like that in digital art?



(Source: [Christies](#), or the blockchain)



Beeple's *Everydays - The First 5,000 Days* has all of the critical elements to [make it digital art's Mona Lisa](#). Famous artist? Check. Beeple had 2.5 million followers at the time of sale. Proof-of-rarity? Check. It will be incredibly difficult to replicate as the mural represents the culmination of 14 years worth of daily dedication. Novel backstory? Check. It wasn't stolen, but it made history as the first major NFT art piece auctioned through Christie's, and the sticker price itself (\$69 million) contributes to the art's rarity. Even if Beeple's artistic reputation took a hit in the future, it wouldn't change the novelty and fame of his *Everydays* initial sale.

So is this a one off, or is Beeple's success actually replicable? Let's look at the underlying market dynamics in digital art.



(Source: [Mario Taddei](#))

Physical art is a [\\$1.7 trillion asset class](#) with ~\$60 billion of annual sales volume. At the end of Q3, NFT market cap was just \$14 billion [according to DappRadar](#). Excluding "profile picture collectibles" (we'll get into those next section), digital art NFTs have represented less than \$2 billion in [total sales to date](#). So NFTs are *still* less than 1% of the physical art market, and digital art is just one tenth of the total NFT market.

Do those numbers remind you of any other four year old asset?

Despite the froth of today's NFT market, this early flight from physical art to digital art could end up looking like 2013's bitcoin "bubble", which crashed 80%+ in 2014, but also marked the beginning of bitcoin's *decade-long* ass whooping of physical gold.

Bitcoin's market cap crossed 0.1% of gold's in November 2013. Wouldn't you know it? The "non-collectible" digital art market is now 0.1% of the physical art market.

I predict that the digital art / NFT market crash will eventually be even more nauseating than the 2015 bitcoin bear market (because these are highly illiquid assets by definition), but the 10 year trajectory of the overall market will be the same: 100x+.

THAT SAID. Before you ape into digital art, there are a couple of things to keep in mind!

Bitcoin's market cap may have managed a 100x in eight years, but if you held through thick and thin, you made just 60x in *price terms* due to dilution from newly mined bitcoin during that time. In total crypto market *ownership terms*, you only made 30x because other new crypto assets like Ethereum hit the market and ate into Bitcoin's Dominance over the past few years.

I bring that up because the design space is *significantly* bigger in NFTs than in fungible cryptocurrencies.



Even if you invest in a Beeple original or another top tier project, it's probably going to be impossible to keep pace with the growth of the *total* NFT "market cap." As such, the winning long-term plays I like in the NFT space are infrastructure related, which will outperform - by a wide margin - the expected value of even the bluest chip NFT projects. Investing in infrastructure in a niche like art (e.g. SuperRare), might not outperform the eventual top 1% of NFTs, but your expected value will be higher, it will save you lots of time, and you won't need to be a tastemaker to have success. As NFT infrastructure expands in every feasible asset category, the infrastructure space becomes especially appealing.

I'm happy to invest in more NFT infrastructure! If you're raising money, please keep me in mind!

*(*As an aside, if you go to the Louvre, you'll see that the Wedding at Cana is about ~10,000x more impressive than the Mona Lisa. I spent 30 seconds looking at the Mona Lisa, and 90 minutes staring at the Wedding at Cana when I visited. Venose is my guy. That thing took serious nights and weekends work. He was around the same age when he painted it, and by the time he finished, I'll bet he hated those ~130 people he painted as much as I hate this report.)*

(Required Reading: Mason's piece on [SuperRare](#). This [masterclass](#) on NFTs.)

3. PFPs: Punks vs. Apes

If you're looking purely at aesthetics, Beeple and other digital artists are probably up your alley. But you'd be missing out on the bigger movement in NFTs surrounding community-owned collections of profile pictures, or "PFPs", which have exploded to \$5 billion in sales through Q3 this year. PFPs derive their value entirely from their early communities and their memes.

The visuals themselves are underwhelming (the 100 EtherRocks selling for seven figures each are literally based on free clip art), but hundreds of thousands of people are spending real money buying into PFP communities to signal that they a) have gotten in on the joke early, b) grok the full history and context for NFTs and why these particular PFPs are worthy of investment, c) desperately need friends and have plenty of money to burn, or d) all of the above.

It makes sense that we'd see interest and enthusiasm for PFPs take off. They are *perfect* for crypto twitter, and the emerging metaverse.

PFP projects with engaged, talented core community members that contribute to the project's culture and economy (like Punks' early NFT adopters), will attract other members. Their owners might even receive preferential access to new projects and events, share community earnings (through airdrops), take on governance tasks, and leverage their PFPs as capital assets (if they become sufficiently liquid). If NFTs continue to rally, more influencers and celebrities will want the oldest PFPs with the rarest attributes, earliest on-chain records, and strongest memes.

Crypto Punks, Bored Apes, and Pudgy Penguins could represent a major component of one's digital identity and pseudonymous reputation in the future. (I can't believe I just wrote that.) Just like brands rely on memes like slogans, images, brand ambassadors, etc. as intangible assets, crypto collectives could leverage NFTs in similar ways, as they have a way of wrapping entire sub-cultures in a single public PFP and gated discord.

It's hard to grok PFPs unless you embrace that these memetic virtual goods are everywhere already, and they are part of our identity. As [Fred Ehrsam told Vanity Fair](#):

"Imagine you live on the internet. The way the world primarily knows you is not through your face or your clothes—it's through your digital avatar. Of course you are willing to spend



a lot of money on something like a CryptoPunk: It's your face to the digital world. Plus, it's the key to enter a small, unique internet club. Being a CryptoPunk owner as a crypto-native is the equivalent of being an Augusta National member as an old-school businessperson."

CryptoPunks are valuable simply because they represent the first PFPs to be minted on the Ethereum blockchain, a historical reality that will be impossible to displace. The 10,000 pixelated Punk jpegs, each with different combinations of "attributes" are a part of crypto history. They have a miraculous origin story, as they were fairly launched, then largely forgotten about, then resurgent due to their unforgeable "firstness." The NFT boom, the viral distribution of Punks as twitter profile pics, and their rising prices made them attractive objects for status signalers everywhere.

I encourage you to read the full interview about Punk 7804's history, which was sold by the founder of Figma for \$7.8 million earlier this year. Again from the epic [NFT 101 Explainer](#) (which I'm afraid I'm almost accidentally plagiarizing at this point):

On buying: "There was one that I got obsessed with the most, that I really coveted, I was really attracted to, I felt like it had just total gravitas. Among the 10,000 CryptoPunks, there were only nine aliens, and of the nine aliens, the one that I really resonated with was 7804, which was a picture of an alien smoking a pipe. It was totally magnetic to me. I couldn't stop thinking about it. And so I saw that the person who had it had sold a few others. And I was like, I think that if I make a big enough bid, they'll sell. And so I bid 12 ETH, which at the time was \$15,000."

On selling: "I believe even more than before that CryptoPunks is art after selling 7804, which is super fascinating. And I think the reason why is after parting with it, I did feel emotional. I felt sad. It wasn't just sad like, "Oh man, this is the digital Mona Lisa and I can make way more money at some point." It was sort of a part of my identity. It was a mask. What are masks? They're objects that you can project identity onto. And for 7804, the wise alien, I felt a bit different wearing it."

Fittingly, the new owner, a pseudonymous buyer who goes by the name Peruggia (after the thief who stole the Mona Lisa!), wrote about his [purchase in similar glowing, unapologetic terms](#).

It makes sense! If enough people associate your digital self with a given avatar it *does* become part of your identity. If you don't believe that, you'll just have to trust good ole Mr. TBI himself.

That's the ultimate PFP paradox: many NFTs might become an unsellable part of your identity.

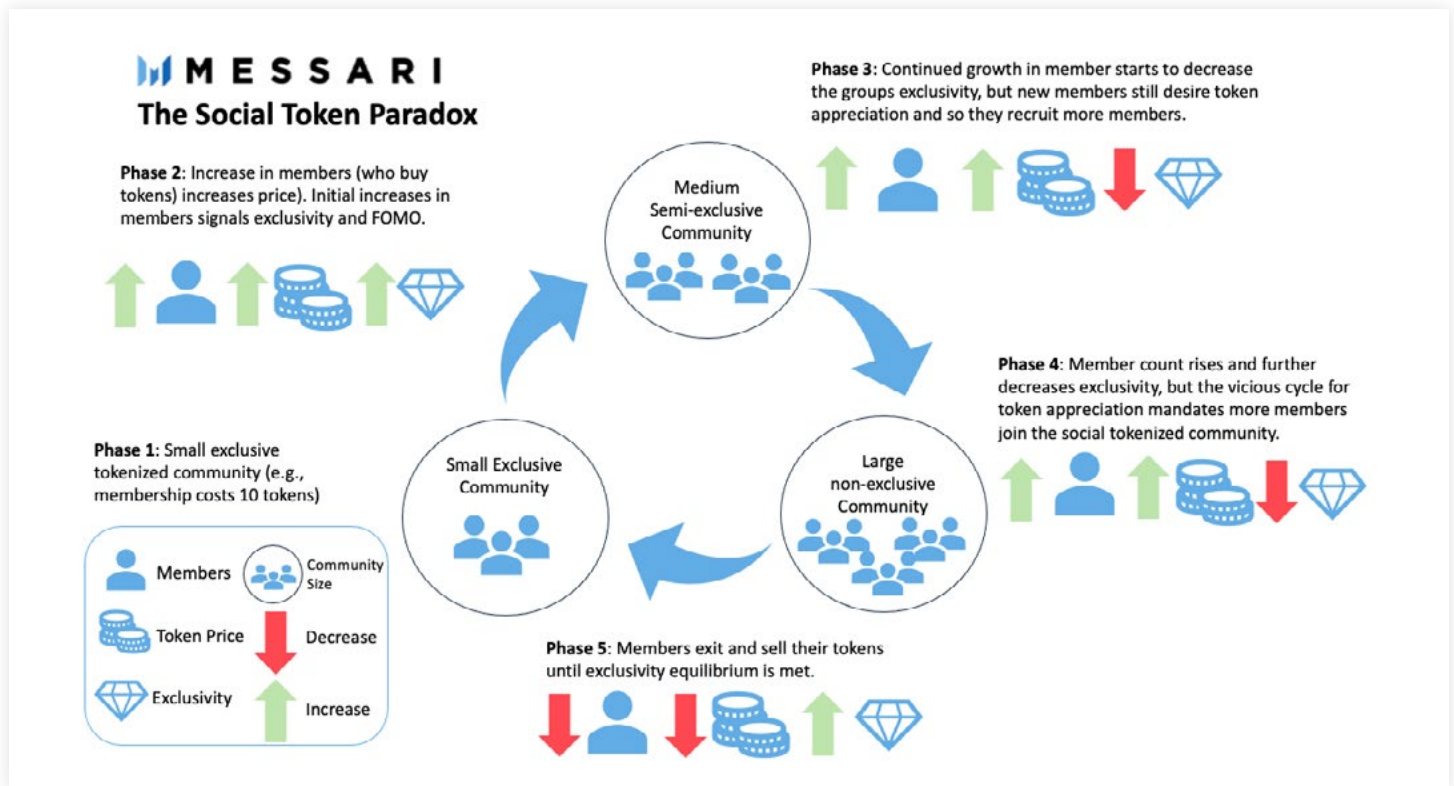
Every collector that becomes invested in their tribe's success wears the team jersey and becomes less likely to sell as they more closely associate with a given community or tie a given PFP to their genuine identity. This can be a good thing if the talent in the network is dense and the party is cool (Jay-Z, Snoop, Serena, and OBJ have Punks), but a tricky thing if the community's values start to deviate from your own and your avatar starts to feel more like a scarlet letter.

There are a few things that have mostly kept me away from PFPs.

1. I don't know what I would do with a PFP and I'm holding out hope that I'm a meaningful contributor to [any plans the South Park creators](#) may have going forward. (Not gonna lie, it will be pretty disappointing if I'm not involved [given my avatar hasn't changed in eight years](#), which is four years more ride or die and rare as your average punk.)
2. As someone who's organized conferences and curated communities of talented people, I can tell you a high price point is a good spam prevention feature, but not a cure-all for community quality. People will start to flock more to invite-only, meritocratic groups vs. pay-to-play drops as soon as we're in a non-hysterical market environment.



3. Along those lines (and we'll touch on DAOs and social tokens later) I was more stoked to get accepted into the Friends With Benefits community than anything else in the PFP realm. Something about earning acceptance (vs. buying access) is hardwired to make us feel good, and I also think it will help mitigate the worst effects of the [social token paradox](#), which applies to any community NFT or social token.



If you're still keen on buying a PFP, you should choose your tribe wisely, and be prepared to keep it as a consumable luxury good vs. an "investment" that can be written off. If you'd rather find other ways to signal your in-group status aside from a PFP, try digital art (go back one section), bags of Loot (three more sections), or a nice plot of land in the metaverse.

I've seen less convincing criticisms of PFP projects, but this one seems [to be a little more measured](#), expressing concerns that the "community benefits" pitch is similar to an MLM scheme. Sure, Bored Ape Yacht Club and Pudgy Penguins have no unique *historical* characteristics that make them special, but you don't own a piece of art in isolation...[it's a community, man](#).

The problem is that the benefits of "community" fall off steeply once you're in the minor leagues of pay-to-join PFPs. The real "in" communities will either have unassailable history, or earned reputation elements. Because I have no problem starting nuclear wars with my writing, I'll end with this: Long Punks, Neutral Apes, Short Penguins and everything else. If you're not first, you're last. (Unless you're porting the project [to a new blockchain](#), then you can be first again.)

(Required Reading: [Apes as an Asset Class](#). Plus, penguins as a project [making the NYT](#), which really gave me "everyone is getting hilariously rich and you're not" vibes.)



4. Fan Tokens

We covered a lot of ground in those last few sections, and hopefully I haven't lost you yet. To recap the meta NFT thesis: attention is finite, the internet is vast, we're tribal creatures driven by [mimetic desire](#), and we're building an insane parallel financial system that may have found a bridge to celebrities and mass retail adoption via crypto-enabled art and collectibles. When you add all of that up, NFTs allow you to "own a piece of the internet."

Now let's substitute "the internet" with "your favorite entertainers" - in music, film, sports, [fashion](#), gaming, etc. Fan tokens are simply collectibles with member rights. Those rights can be financial (tickets, shared royalties), or non-financial (social signal as a super fan, experiential access), or a combination of the two.

Think of what might happen with NBA Top Shots for illustration.

Top Shots are collections of virtual playing cards that capture NBA players and iconic moments from the game. The dumb v1 of Top Shots? They're collectibles like old baseball cards. But how about v2, v3...v8? Top Shots collectors might get invited to VIP players' events in the off-season or to the All-Star Game. Maybe they'll earn entries in a lottery for courtside playoff seats for their favorite home team. Or have a say in the league's new jersey designs.

Or in music, let's say you bought one of the first 1,000 NFTs for your favorite indie band's new album. They go mainstream, and now you've got backstage passes (via your NFT) for their next tour stop in your town. You get a split of the royalties from a Netflix documentary on their rise. In fact, your NFT gives you voting rights in the DAO that voted on the royalties deal in the first place! Maybe that NFT gets you an [Audius airdrop](#).

What if [Lil Nas X had dropped a token](#)? He went from 900 to 50 million Spotify listeners in two years. If you were one of the 900, would you have purchased (or been airdropped!) a \$NAS token back then for helping him promote his early singles? \$NAS could have tracked early "true believers" and allowed fans to personally share in his financial success.

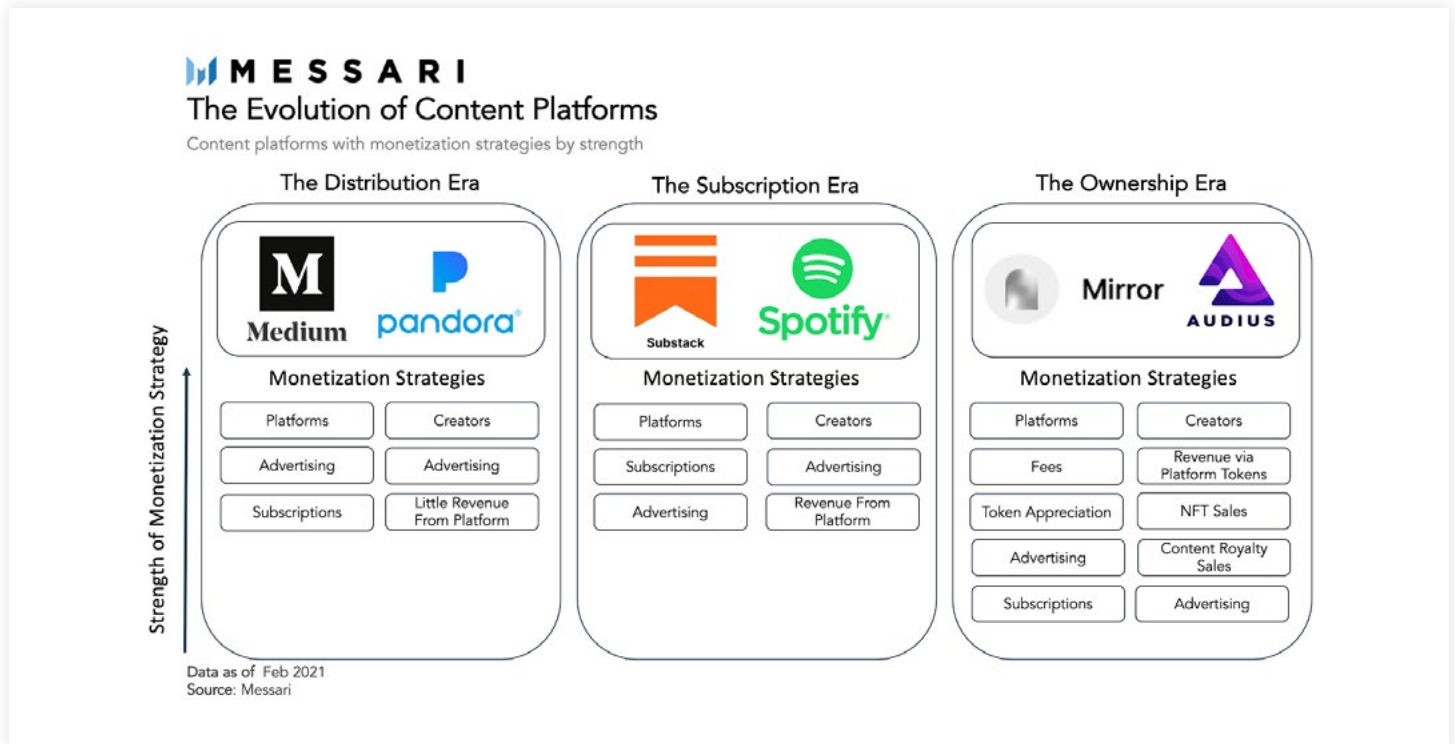
	Year		
	2019	2020	2021
\$NAS Price	\$100	\$1,000	\$10,000
Tokens Outstanding	1,000	1,000	1,000
Market Capitalization	\$100,000	\$1,000,000	\$10,000,000
Multiple of Money	-	10.0x	100.0x

(Source: [Social Tokens and Creator-Centric Economies](#))



“Win and help win” is a good model for fans and the famous alike, and it’s something that applies to smaller creators with much smaller audiences (“1000 true fans”) as well. EDM DJ [3LAU dropped an NFT](#) and made \$12mm. A group of documentary producers raised \$2mm to tell the [story of Ethereum](#).

Creator tools like Substack (newsletters) and Callin (podcasting) are making it easier than ever to abstract away the “business side” of art, and I could see NFTs opening massive avenues for growth in those communities just like Mirror has already done in its battle against Medium.



Fan tokens, whether they’re NFTs or fungible social tokens (like those available on Roll*), could be what helps crypto cross the chasm into mainstream adoption as more tribes become owners.

If digital art and PFPs are good news for visual artists, fan tokens unlock a whole new value stream for the rest of the entertainment industry (film, music, sports in particular). They also break the stranglehold that LA has over film and music, better connecting up-and-comers, growing the pie for all creators, and slashing LA producer “take rates” by 50-75% or more.

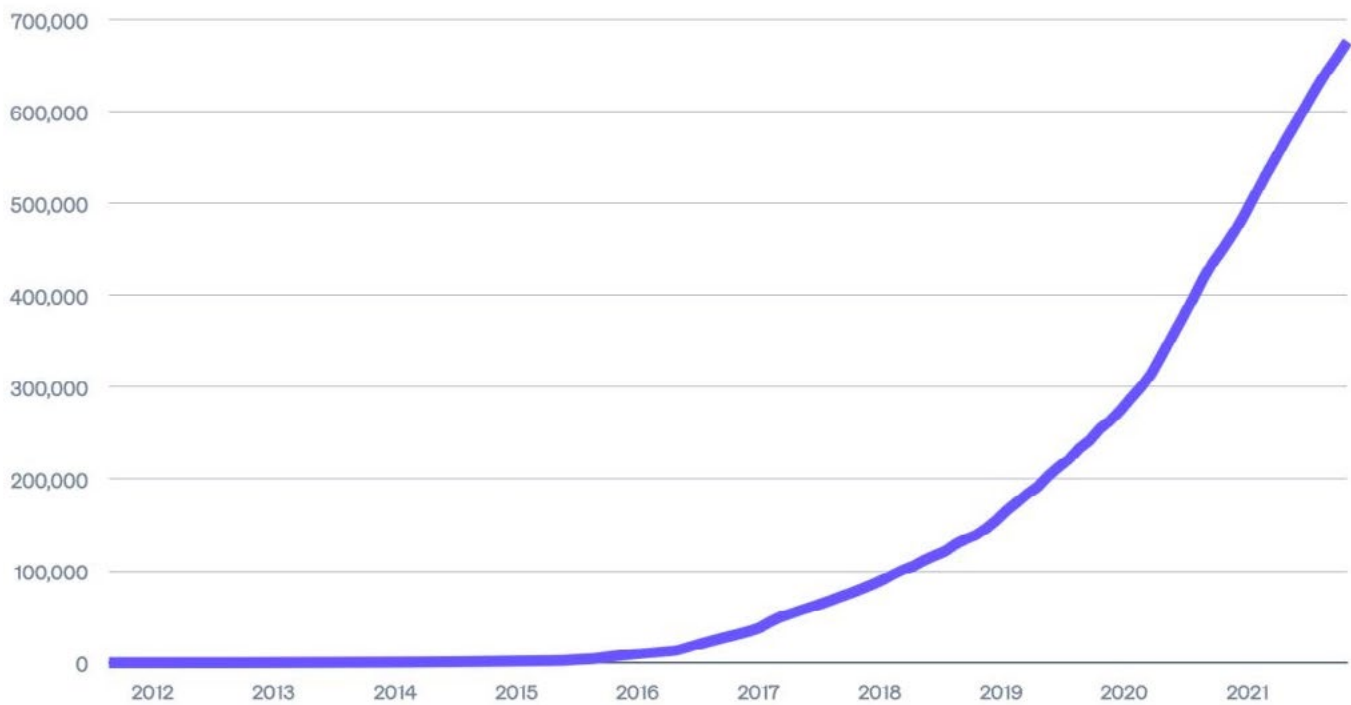
I like the Uniswap vs. Binance comparison here.

LA (Binance?) is probably fine for catering to users who only want access to the most famous acts. But if your interests lie outside of the top 100, you’re likely to be better served as a fan by the peer-to-peer marketplace of NFTs.

That’s good news for a creator economy that recently passed \$10 billion in aggregate earnings, and is [growing 48% year-over-year](#) before NFTs. This chart is about to go vertical *with* NFTs.



Total creators



(Source: [Stripe](#))

It might be a short hop from “fan tokens” to “initial person offerings” or “[income sharing agreements](#)” - which are controversial, but probably inevitable. I expect the boom in fan tokens to lead to a creative resurgence (interest and feasibility) of ISAs. We’ll see “fan tokens” for promising students with the potential to drop out of college and start working in Web3 instead.

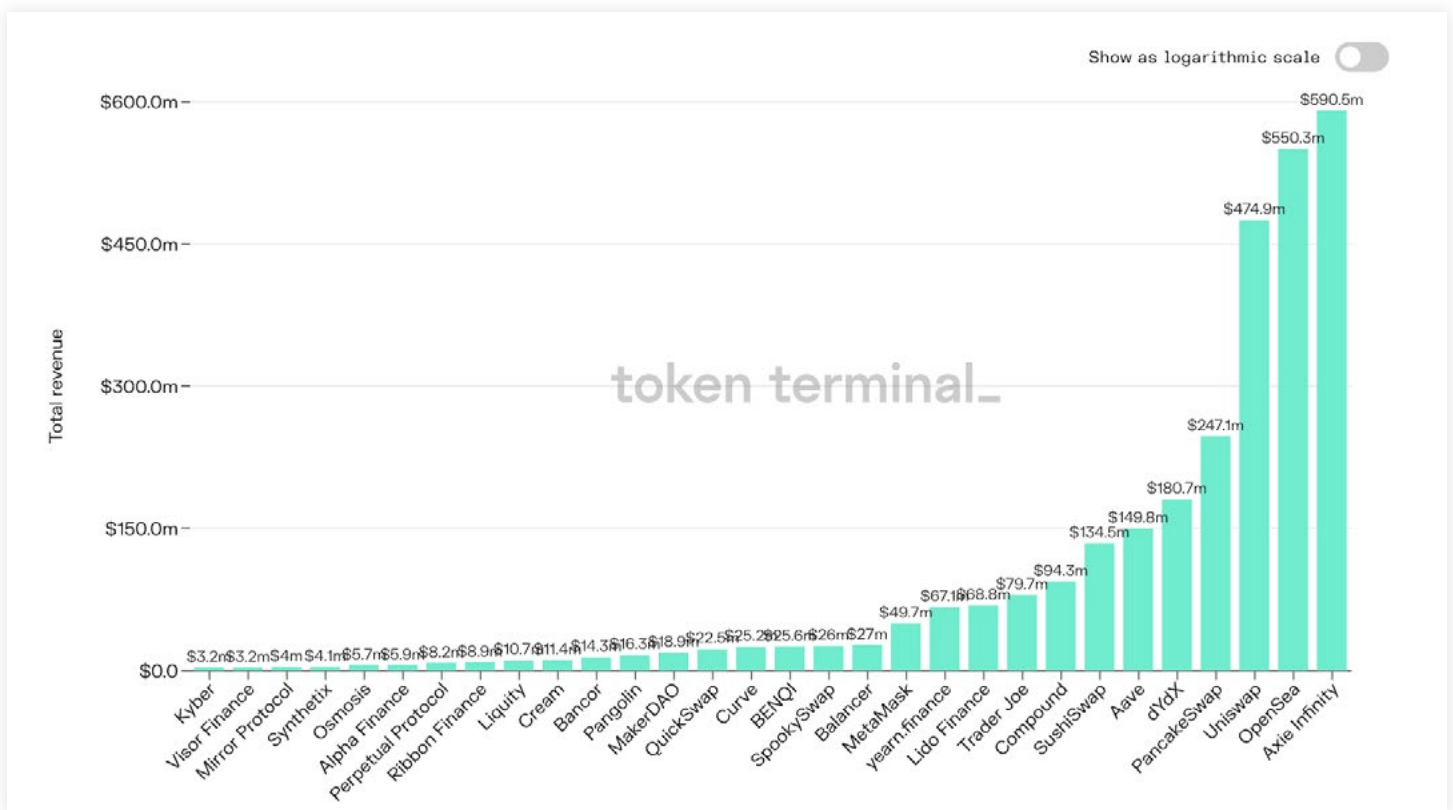
(Required Reading: [Audius](#), [The Evolution of Content Platforms](#), [The Evolution of Blockchain Based Music](#), [The Collegiate Athlete Economy](#), [The Sport of Speculation](#), [The Social Token Bible](#), and [The Value Capture of Social Tokens](#))

5. Axie Infinity and the Play-to-Earn Revolution

One reason the gaming industry has been so dominant in the entertainment industry ([bigger than the movie and music industry combined](#)) has to do with its early embrace of the internet’s new mediums (streaming) and business models (freemium and virtual goods marketplaces). It would be ironic if those same studios missed crypto, especially since the pace of growth and revenue generation in crypto gaming isn’t theoretical anymore. It’s mind-melting.

Consider the economics to Ethereum’s top three revenue producing apps in the past quarter: Axie, OpenSea, and Uniswap. Axie and OpenSea generated more than \$500 million in revenue in the past three months. Uniswap was next with about \$475 million. After that, both Axie and OpenSea were each [larger than the next five Ethereum applications combined](#).





Axie's growth is finally [showing signs of flagging](#), but the play-to-earn gaming trend it pioneered is here to stay. The amount of money these platforms have raised is nuts, and they're set up for a full cycle of iteration and development regardless of whether the sector's frenzy subsides next year. a16z poured [\\$150 million into Mythical Games](#). Enjin announced a [\\$100mm gaming fund](#). FTX and Lightspeed [invested \\$21 million in Faraway Games](#). On the *same day*.

As crypto gaming is having its moment, there's an innovators' dilemma playing out at the incumbent gamemakers. Steam [has banned crypto](#). Epic Games Store will [tentatively welcome](#) games that "make use of blockchain tech," provided they "follow the relevant laws, disclose their terms, and are age-rated by an appropriate group." But even the most enthusiastic incumbents are unlikely to face a seamless Web3 integration. We saw how quick and extreme the backlash might be from anti-crypto users when Discord even [teased an NFT integration](#).

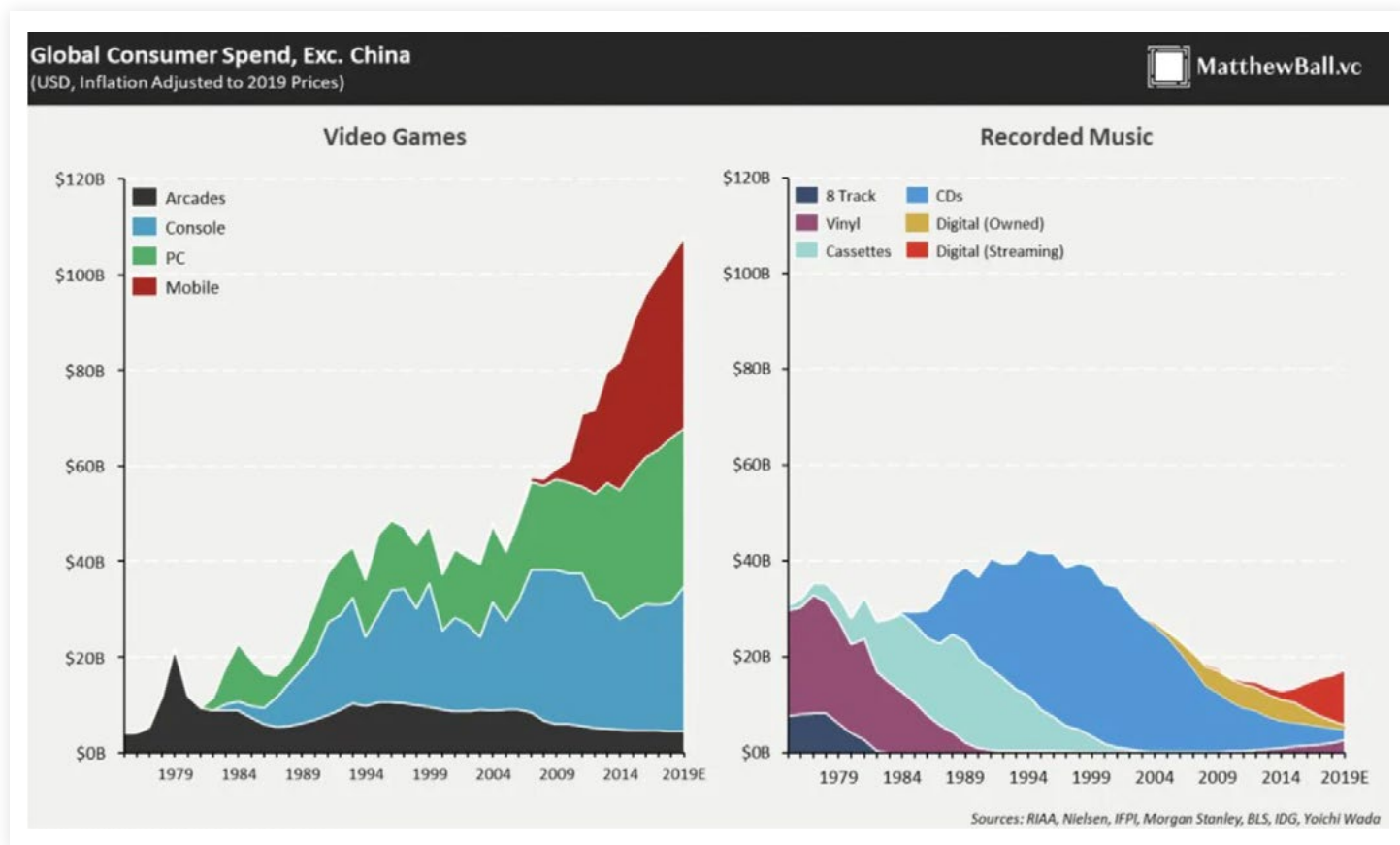
I don't think the early reluctance will persist. My bet is that a top five gaming studio enters crypto in a meaningful way next year, most likely via M&A of other Web3 games. The benefits to being early on a ten year trend will prove too compelling (capitalize on the NFT craze while things are hot *and* get an edge on the imminent talent war) for all of the market leaders to sit on their hands. A slate of small-scale transactions might allow the incumbent to sandbox an ecosystem of bets and work out the kinks before bringing the tech to their full universe.

It's not just opportunism that will drive them. The threats posed by inaction are real, too.



Today's gaming giants generate \$120 billion in annual sales with a 100% default take rate. Compare that to Axie, a meh game not even available in app stores. Its play-to-earn model reduced customer acquisition costs to zero, attracted millions of users and a \$10 billion market cap in less than a year. That'll wake 'em up. No gaming CEO wants to get Blockbuster'd.

This chart should be on the first slide of each gamemaker CEO's board deck going into 2022.



(Source: Matthew Ball's [Epic Games Primer](#))

(Required Reading: [Play-to-Earn 101](#), [Colossus Research](#), [The Complexity of Axie's Economy](#))

6. Looted: Composable NFTs

Words on black text. The [Loot sale](#) this summer was a Rorschach test for NFTs. You either thought it was the brilliant introduction of a new "composable" NFT primitive for digital gamers, or you thought it was [Billy Madison-tier stupid](#). It was probably a little bit of both, honestly, but there were a couple of takeaways I had from Loot that were positive. (The VC "emergency" newsletters, for instance, should be minted as NFTs for the lulz.)

Something *like* Loot sure seems like it could be the backbone for a new line of Web3 native games. If you look at the amount of money being raised for digital goods, a critic might point out that this is more likely to amount to a massive wealth transfer from ETH investors and punters to creators and "decentralized gaming" studios.



The virtual goods for most of these new fantasy games will likely look and feel the same, yet different communities are sure to sell the same abstractions as their Web2 counterparts. Is an Ember Sword going to be compatible in every other game? Perhaps, but why pay for the sword in the first place if you can buy the Loot sword, and *every single* gamemaker builds an abstraction that honors and recognizes the value of that item.

Cynics probably *are* underappreciating how big a Loot-like project can be, and I say that as someone who hates the v1 and the fact that otherwise rational people have bid up lists of words at the same rate as a company others have built over four years. (ahem.)

But I'm not a hater. The big takeaway I have on Loot echoes what I said on PFP communities more generally. People who were three weeks late to Loot, but relatively early otherwise to the world of crypto gaming seem unlikely to honor or value a single project's word list drop to a bunch of hoarder VCs. I'm fairly certain there will be a superior play-to-earn version of Loot that employs a meritocratic, cross-game fair launch of goods.

It could be structured as an airdrop to [other serial crypto gaming grinders](#), or incorporate a play-to-earn points system that tracks new game playing commitment across any projects that opts in to the new "composable list of goods" universe. You'll find Loot's successor when gamer influencers write threads on the project, not the breathless crypto twitter speculators.

(Required Reading: [We Like the Loot](#), [Our Network's "Emergency" Issue](#), [Time Scarce NFTs](#))



7. NFT Financialization

Unique assets are less liquid than fungible assets by definition. That creates some challenges when it comes to price discovery in the NFT market, not only for secondary sales, but for virtual asset collateralization. There's been a few early attempts to tackle this challenge head-on, and it will be one of the most important areas of NFT infrastructure development in the years ahead. NFTs are insanely volatile, and there may not be bids for many of these assets in a bear market. Is it even possible to borrow against NFTs while also hedging out the idiosyncratic price risks of specific projects and pieces?

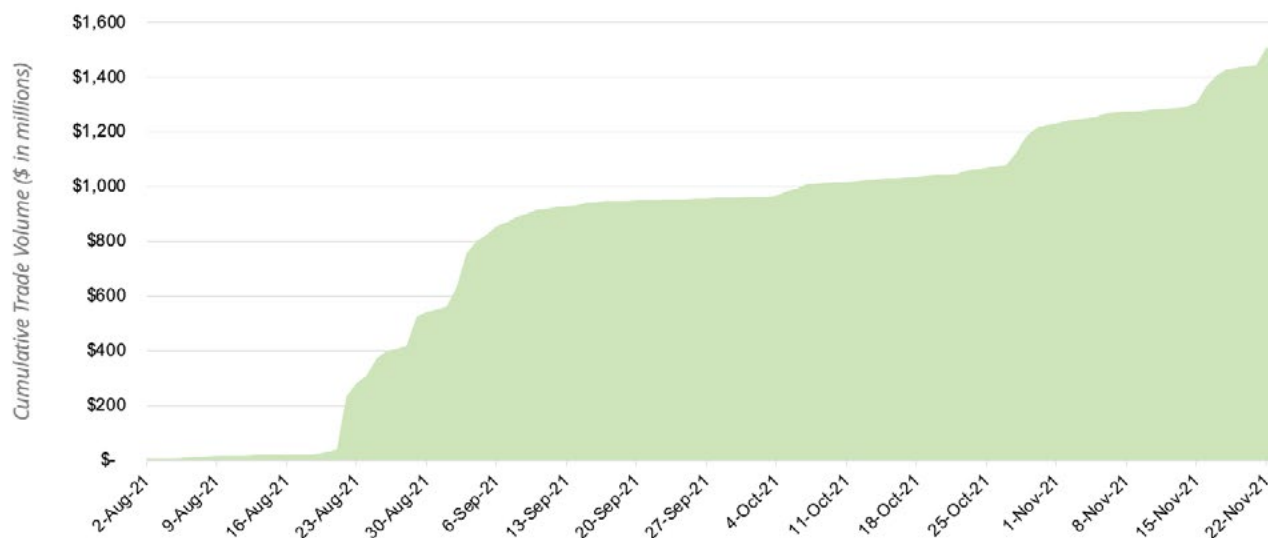
Maybe, but only if you can get lenders comfortable with *baskets* of these assets.

Projects like WHALE bundle a collection of NFTs from a single collector, and tokenize access to the portfolio. PleasrDAO and PartyDAO are building [collective bidding infrastructure](#) that helps groups start public auctions for NFTs (fractionalization by another name). Pricing derivatives and collateral off of [floor prices](#) could be disastrous, as many "floors" actually have no bids at all. The Punk [FLOOR token](#), on the other hand, seems like the better approach. It's a bit of a misnomer - the token aims to track the price of a *mid-range* punk by aggregating and fractionalizing ownership of 104 punks of varying rarity. FLOOR could conceivably be a buyer of last resort in bear markets (flight to the most liquid collection), and an inventory seller in bull markets (when bidding is most competitive). In the meantime, the token trades at a ~20% premium to the Punk floor price today - not bad if you want access to Punks, but don't have \$500k lying around.

MESSARI

Fractional Quickly Surpasses \$1.5 Billion in Cumulative NFT Volume

Fractional cumulative trading volume (ERC20 fractions of NFTs)



Data as of: Nov. 23, 2021

Source: Dune Analytics, query by mizmatcat

It reminds me of Matt Levine's hottest take on [fractional NFTs](#):



“Owner/securitizer: I bought this unique pointer to an image of a dog for \$4 million.
The public: Ahahaha good one, congrats, money well spent.
Owner/securitizer: Also I will sell fractional ownership interests in it for like \$225 million.
The public: Ahahaha another good one, that joke is worth \$225 million to us, here you go.

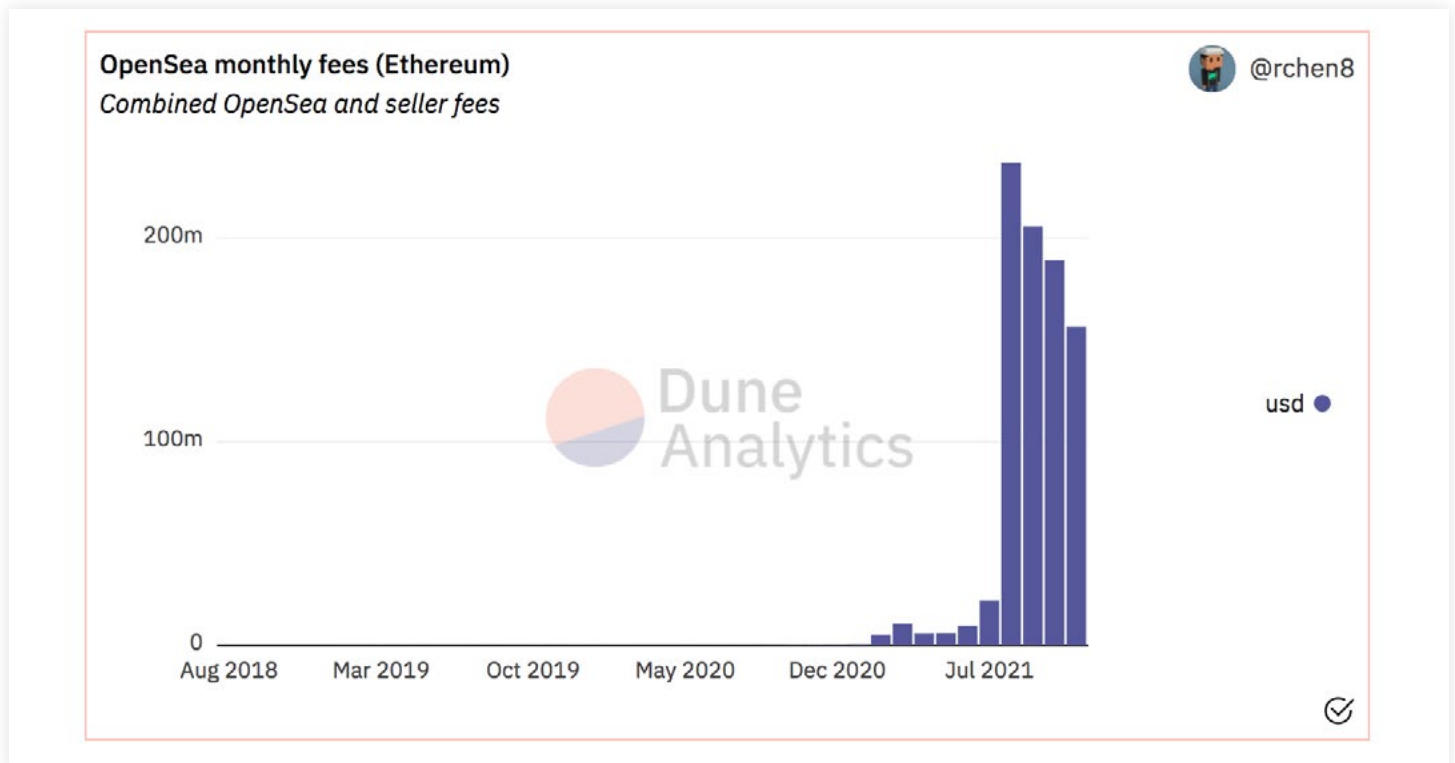
It's two jokes so it's worth 55 times as much. I don't know!”

I'll admit I had trouble wrapping my head around how NFTs which are not 1:1 mints could still fractionalize their ownership effectively. But there are multiple real world analogs: timeshares, and subletting in real estate, Rent The Runway in fashion, personal seat licenses in sports, etc. It will take time to get NFT fractionalization right, and I predict we'll see some seismic blowups from projects that overestimate the value of their collateral, but long-term this will be a huge unlock for the crypto economy. It starts with PFPs, art collections, and metaverse land.

(Required Reading: [The Financialization of NFTs](#), [Fractionalization Landscape](#), [Value Drivers](#), [How to Fractionalize NFTs](#))

8. OpenSea & Friends

Over the past 18 months, OpenSea* has enjoyed one of the fastest revenue ramps of any business in history. They've gone from a seed-stage startup to a [potential decacorn](#), and I think they could eventually be a \$100 billion company (or network) if they continue to execute. This chart highlights their massive run-rate P&L.



(Source: [Richard Chen on Dune Analytics](#))



Numbers like this are why Coinbase plans to [enter the market](#). FTX is [already there](#). Same with [Gemini](#). Legacy companies like [GameStop](#) are salivating looking at those numbers. Sotheby's [might even go direct](#). It's validation of the size of the emerging NFT asset class rather than a bona fide threat to OpenSea's business. The bigger question to me is not whether OpenSea and other pure play NFT marketplaces succeed, but rather how do they verticalize over time.

The answer might be straightforward - OpenSea and virtual good pure plays may dominate in the virtual goods realm, while exchange-affiliated NFT marketplaces dominate on the financialization side. You'll buy and sell Punks and Decentraland plots on OpenSea, but you'll buy and sell FLOOR tokens and mortgage LAND on Coinbase or FTX.

In that way, the SEC's hostile crypto regulations could be OpenSea's strongest tailwind, as there will be no need for an NFT marketplace to cross or even step up to the securities law line given the explosive growth across the rest of their platforms. Leave the land mines to the exchanges and their in-house broker-dealers.

(Required Reading: [The Reasonable Revolutionary](#), [A Beginners' Guide to NFT Marketplaces](#))

**Again, I am an early investor. I would like to invest in more NFT infrastructure like OpenSea. :)*

9. The Cryptoverse

Matthew Ball defines the metaverse as a [virtual realm with seven qualities](#): persistence (a permanent, always-open global hangout); liveness (real-time just like the physical realm), uncapped user "presence" (a stadium vibe); economic robustness (NFTs are the goods, fungible tokens are the currencies and commodities); relevance across digital and physical worlds (no walled gardens!); interoperability (portable goods, identities, IP); and user-driven evolution ("content" and "experiences" are created curated openly vs. through a central company).

If you believe there will be places like that, and appreciate that we'll be spending more of our time there in the future, it's probably obvious we'll ascribe progressively greater value to digital goods versus physical goods.

The only question then is which direction will the metaverse evolve? Will it be citadel-centric (big tech, walled garden dominated), or frontier-centric (open, cloud-based, and crypto-secured).

Alison McCauley's [piece comparing the recent Decentraland and Roblox festivals](#) illustrated the near-term differences we can expect to see between the two:

"Over the last week, two simultaneous global metaverse festivals took place, giving us a glimpse of the competing sides of today's battle for control. One was produced by an established gaming player, the other created by a decentralized metaverse pioneer.

Roblox, a public company with 2020 revenue of \$924 million, held the first virtual music festival on the Roblox platform in partnership with music event producer Insomniac. At the same time, Decentraland, an open virtual world totally owned by its users, held its first Metaverse Festival.

Both events gave us a glimpse of how digital technology can enhance the experience of attending an event; how live performance can be smoothly integrated; how exclusive experiences can be woven in; and how we can now congregate, no matter where we live, at global scale. Yet they also gave us an indication of the trade-offs ahead.



The Roblox experience was nothing short of slick, with the high-budget design of corporate digital experiences. In conjunction with the Electric Daisy Carnival (EDC) in Las Vegas, the virtual experience not only integrated EDC's live stages and impressive lineup, but offered games, virtual tents and artist meet-and-greets.

Decentraland's festival was carefully designed and orchestrated with sets from more than 80 artists including Deadmau5, a merch store for NFT wearables—and even digital portable toilets. The Decentraland festival felt like the community project it was—more creative, less produced.

Yet what's most striking about Decentraland was happening behind the scenes. In this world, people can directly own and cultivate digital land. They can conduct commerce directly with other participants. And instead of relying on a corporation to run the world, its users govern policies on their own, through a Decentralized Autonomous Organization (DAO)."

Anyone who hasn't stepped foot in one of these festivals might think "there's no scarcity in digital art because you can right click save the jpeg." But what the right clickers don't get, is that this will be both technically and socially impossible in the metaverse, where digital art, avatars, land, etc. are all seamlessly tied to blockchain receipts.

Could you imagine going to the Decentraland party in a knockoff dress? What if the real owner showed up? While she walked around with a literal glow of authenticity, your fraud would be exposed on the spot as a blinking red cone of shame hovering over your avatar. How gauche.

When it comes to the metaverse, my money is on the cryptoverse near-term. The citadels medium-term. And in the long-term it's a coin flip. Let's talk about why.

(Required Reading: [Metaverse Primer](#), [The Open Metaverse OS](#), [Stratechery's Metaverses](#))



Eth Apps VS Web 2.0 App Stores
[View this NFT on OpenSea](#)



10. I said Metaverse, not Meta

The metaverse doesn't have to be [a dystopia](#).

With a Web3 back-end, we can live in a world where designers compete in a competitive fee-for-service marketplace for the rights to host you and monetize your data. "We'll make it 100x easier to sell your data, but keep 20% of the profits" seems like a fair medium-term bargain that will entice users to the cryptoverse, and pressure Web2 companies to lower their take rates. I don't see most modern tech giants offering compelling alternatives to crypto when it comes to the open metaverse. But Meta is an exception.

An incumbent like Meta - with its cash cow "blue app" and Instagram, and its under monetized other products - is an interesting player in the metaverse because it can afford to experiment with new monetization models and user-incentives under some of its massive digital-first product lines (Oculus, Whatsapp, and Messenger), without jeopardizing its core ads business in Instagram and "the Blue App", which more closely tie back to our "[real world](#)" identities.



The Fight For The Metaverse
[View this NFT on OpenSea](#)

I, like the rest of the internet, have a lot of thoughts on Facebook / Meta in general. I agree with Qiao that the goal with the renaming is to move away from the [toxic Facebook brand](#). I agree with David Sacks that the media's witch hunt of Zuckerberg, reflects their own bad behavior - which is [orders of magnitude worse](#). I also agree with Balaji that Zuck's resilience is impressive, and he's [worth betting on and believing](#) when it comes to the Meta pivot...up to a point.

Yes, Zuckerberg might be the only roboticon on the planet who could have made an earth-shattering announcement like Meta's [feel more cringe](#) than exciting. But \$10 billion per year is a mammoth, necessary investment that will lay the foundation for the metaverse much like the rollout of fiberoptics in the early aughts. Meta could brute force the path for hardware, graphics software, and mobile bandwidth to the point the metaverse becomes truly immersive.

I've been excited about what Facebook might build in VR since I outlined my first virtual octagon with the Oculus Quest last year. It was

a moment of tech euphoria that I experienced only twice before: taking my first Uber ride, and reading the bitcoin white paper. I'll be more excited if Meta keeps its promise to keep its metaverse work open. The company's success will hinge on its sincerity, and that *should be* its preferred path. Owning the dominant platform of the only inhabitable land yet to be fully settled (the cloud) is orders of magnitude more valuable



than owning a single citadel on that land. I think Zuck knows this, and he's saying the right things. Ben Thompson's interview with him is worth reading [in its entirety](#).

(Required Reading: [The Zuck Interview](#), [Stratechery on Meta](#))

11. Non-Fungible Credentials: Your Modular Identity

Since 2018, I've been intrigued by the concepts of curation markets and token-curated registries as a digital replacement for credentials.

NFTs may prove to be the missing building blocks that finally make them work because they 1) granularize achievements, 2) have technical specifications that will make them easy to integrate across a variety of platforms, and 3) are composable, which means they can evolve over time.

Take a digital diploma for instance. In the 1.0 world of token-curated registries, these diplomas would reflect a binary pass/fail outcome, and it was easy to [corrupt the integrity of the diploma](#) by bribing your way onto the registry or inappropriately discriminating against an otherwise qualified candidate via mob rule.

NFTs would make things a bit different. Instead of starting with an overarching credential (the diploma) NFTs start with each discrete item on the rubric. "Did you complete this degree?" becomes "Did you complete this question? Did you complete the 100 questions to pass this course? Did you complete the 20 courses necessary to attain this degree?" That's 2,000 discrete NFTs for one diploma, and the top 500 might determine your "major." Moreover, we can use things like rarity attributes to ultimately solve the subjectivity problem in credentialing. Your NFT might have a different attribute if your work was deemed best-in-class or top 5%.

At the same time, I think NFTs will also be the technical backbone that ports your *real world* credentials and identifiers to the new world.

You won't need to enter your driver's license every time you need to prove your identity - your digital signature will unlock access to the NFT of your license, or your health record, or your insurance, etc. We're talking about a 1000x improvement in the portability of our identities, and the consistency and comparability of our credentials.

The potential to visualize credentials and reputation via artistic representations of your NFTs is eye-opening. At a virtual meetup, you might choose to showcase credentials directly on your avatar's lapel (a speaker or VIP might wear an NFT "registration" badge). At a social hangout, you might choose to "wear" a different reputation (isn't that all of fashion?) to signify status ("looks rare") or humility (an ESG brand's virtual apparel).

NFTs are literal pictures worth a thousand words of resume ink. One of the biggest trends we'll see in 2022 is the move towards meritocratic, earned NFTs. If your crypto wallets become universal [digital identification](#), then NFTs will represent all of the subcomponents of your identity. [Composable membership](#), [earned semi-transferable NFTs](#), and yes, TCRs will come back.

(Required Reading: [Examining the Types of Crypto Curation](#))

12. Namespaces & Data Sharing

Two more building blocks of non-fungible identity are worth noting: the decentralized domain name services, and the data marketplaces that will make personal data relicensing trivial.



Crypto domain services are an obvious killer app for managing Web3 identities. One of the building blocks of internet infrastructure has been domain name registration. Web domains made IP addresses human readable, and the same will be true for many blockchain-based addresses. If PFPs make digital wallets more visual, registries like ENS and Handshake make them more interoperable, and trustworthy.

Nearly half a million ENS names were registered before the protocol's [billion dollar airdrop](#) to its early users last month, and it's conceivable that the network could [rival or surpass centralized DNS maintainers](#) like Verisign (\$27 billion market cap) one day. Verisign manages nearly 85% of the world's 200 million websites today, but the domain space for identities in Web3 could be 2-3 orders of magnitude larger, as there are 40x as many people as websites, 5x as many internet connected devices as people, and a lot of global citizens who won't necessarily trust Verisign given decentralized alternatives.

Clear identifiers will also make it possible for people and their devices to extract value from their data. According to the International Data Corporation, less than 1% of the world's data is actually used and analyzed, even though the amount of "[potentially useful](#)" data doubled from 20 to 40% from 2012 to 2020. With the market for data analytics swelling to nearly \$100 billion by the end of next year, and case studies like Netflix's [\\$1 billion big data / customer retention investment](#) becoming more widespread, companies and users alike will want to better monetize their data. In Web3, protocols like Ocean provide the wrapper for these data packets by encouraging public sharing and secure monetization of data, and better price discovery via liquid data markets.

The addressable market is FAMGA's ad revenue (and then some), so there's a lot at stake.

(Required Reading: [Deep Sea Dive Into Ocean](#), [A Primer on ENS](#), [Decentralization of Identity](#))

13. DeSo Lotteries

What happens when you combine PFPs, permanent .eth identifiers, data composability, and data marketplaces that price data packets with AI? You get a Decentralized Social Network and potential lottery-like rewards for early and viral user-generated content.

Web3 social media seems like an inevitability these days, and may already be here with the advent of projects like the literal Decentralized Social (formerly [Bitclout](#)), Twitter's [BlueSky](#), and [gm.xyz](#). It isn't obvious which early networks will take an early lead or demonstrate true staying power, though. Decentralized Social raised [\\$200 million from a16z](#) after raking in a small fortune in sales from its "Clout" (rebranded to \$DESO) token, and is paying that forward with a [\\$50 million fund](#) of its own to spark community development, but the UX is clunky and I doubt "pay to tweet" is a sensible model.

The core concept is sound, though: reward any user that "goes viral" financially. TikTok got this right (boost users' early posts to get them hooked) without the token rewards. A Web3 startup will get it even more right *with* financial rewards.

It's not just users that will benefit, either. DeSo protocols will incentivize dozens of competing developers to build services that compete for the right to host users and their data - either via token incentives ("attention farming?"), or killer products that optimize for things the *user* actually wants and is willing to pay for, such as personal growth, safety, peace of mind, etc. A front end could recommend follows based on owners of other similar assets and NFTs, allow you to [sell or auction NFTs directly from your user profile](#), or create a better social graph.

I could see Adobe's [new "prepare as NFT" feature](#) in Photoshop minting a ton of early winners in DeSo's viral



Olympics. “Content Credentials” are certificates compatible with NFT marketplaces like OpenSea, which prove an art source’s authenticity, and 100x’s the ease of creation and distribution of new NFTs.

Naval put it best when he said, “DeSo is waiting for its [satoshi moment](#).” Right now, the field is wide open, and I’ll be spending a lot of time on the up and coming platforms in 2022. [gm](#)

(Required Reading: [Twitter Tips, NFTs and the Twitterverse](#), [The Rise of Crypto Media](#))

14. The Physically Decentralized (Permanent) Web

We can make all of the pie-in-the-sky predictions we want about crypto taking over [insert industry] and being an unstoppable force. The truth is that our *physical* survival depends on the decentralization of hardware. The war against censorship resistance will be fought in the cloud, and how effectively we wrest control of that infrastructure from today’s dominant monopolies will be the difference between an open internet, and a police state.

Of the various components in the Web3 hardware stack, decentralized storage is arguably the most robust.



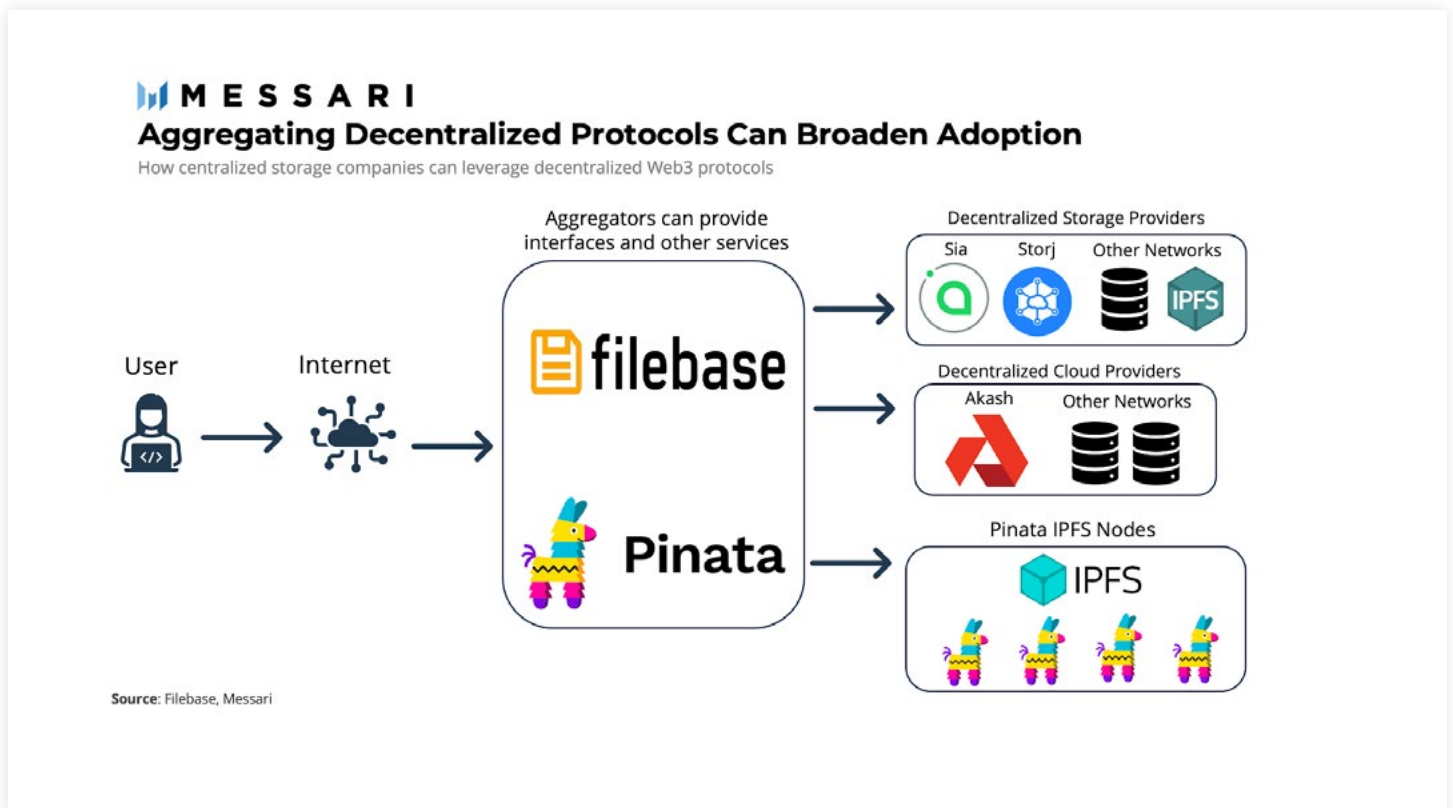
Unlike its predecessor BitTorrent, which relied on required content to be hosted on local servers, IPFS offers a novel decentralized system which allows *any* node to store data. But these nodes must empty the content they “pin” (cache) eventually, which led to the introduction of Filecoin, an incentivized storage network built on IPFS that verifies the network is storing the data it says it will. As the first blockchain project dedicated to file storage, Filecoin creator Protocol Labs garnered a massive treasury, which it used to fund a [laundry list](#) of other projects, accelerators, and developers. Filecoin [leads](#) its pack of competitors in terms of data stored on its network for now, though they are hardly alone.

[Arweave](#) and [Sia](#) emerged this year as formidable competitors. Each network uses its own blockchain (or in Arweave’s case a “blockweave”) as the foundational layer for their decentralized data and app storage solutions. These networks make different design tradeoffs, but can generally be bucketed into two categories – on-demand storage (Sia and Filecoin) vs long-term storage (Arweave).

Even though data stored on Arweave comes with a premium (since the user has to pay for lifetime storage), the protocol has gained traction in the NFT landscape as a permanent solution for storing NFTs and their [metadata](#). Arweave has become the preferred storage layer for Solana NFT projects in particular, which led to a spike in Arweave’s network growth over the past two quarters. Arweave applications like Koi and Kyve are enhancing the potential services that Arweave can provide to other blockchains and users.



Decentralized storage is a key layer of Web3 infrastructure that will steadily gnaw at the margins of existing internet infrastructure providers, particularly with the rise of Decentralized Storage Aggregators like [Filebase](#)* and [Pinata](#), which provide the interfaces, optimizations, and service layer needed to offer custom storage solutions to new customers. (CeDeWeb3?)



Just as Coinbase offers DeFi services from protocols like Maker and Compound, these abstraction services will make Web3 storage protocols more accessible to new audiences.

15. Physical Network Scaling

A truly decentralized internet also requires permissionless and censorship-resistant hardware networks that support computation and networking.

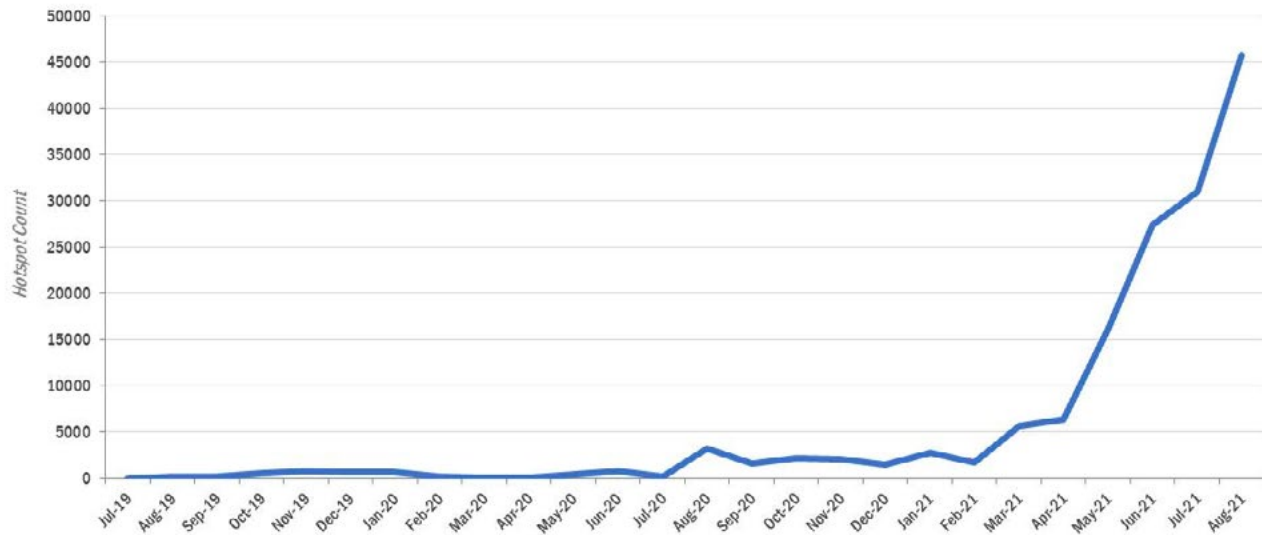
In last year's thesis, I said, "Right now, Helium and its long-range IoT networking marketplace seem like the early favorite to breakout." [You're welcome.](#)

Helium is one of the strongest performers (+3,000%) within the Web3 sector year-to-date as its global wireless hotspot network continues to attract huge partners like DISH, who announced that they would begin to deploy Helium's new line of 5G hotspots. Helium has a variety of partners producing [a dozen types](#) of its miners, proving that hardware can be scaled effectively using token incentives. Hardware is a tough business model, and Helium showed how effectively hardware businesses [could bootstrap expensive two-sided marketplaces](#) with the right user economics.



Hotspots Added to the Network Monthly

The number of hotspots being added to the network has parabolically grown as supply chain issues are resolved, more manufacturers come online, and network effects spread



Data as of Sept. 02, 2021
Source: Sitebot

Similarly, decentralized video transcoding protocol, Livepeer continues to gain traction and accrue fees as a result from its rapidly growing video network. Within the Cosmos ecosystem, application-specific blockchains like Akash [continue](#) to expand and produce [early signs](#) of sustainable network revenue as they match developers who deploy their Docker containers at a significantly reduced cost to cloud providers like AWS or Google, and data centers who can rent excess capacity similar to an Airbnb for data. Other hardware networks like [Andrena](#) and [Althea](#) (pre-tokens!) are tackling the internet service provider layer by enabling communities to set up hotspots and antennas that bring internet access to nearby towns.

While Livepeer operates on Ethereum, Akash, Helium, Arweave, and other hardware-intensive networks have chosen to build out their own blockchains. As the world moves towards its all but certain multichain future, expect these hardware networks (or their more effectively decentralized competitors) to serve as a foundational layer for the uncensorable internet.

(Required Reading: [Web3 Network Revenue](#), [Helium's Exponential Coverage](#), [The Storage Layer & Importance of Metadata](#), [Arweave: Permanent Censorship Resistant Storage](#))

DeFi 2.0

1. The USDT Bridge	116
2. DAI vs. UST	117
3. The Algorithmic Stablecoins Renaissance	118
4. The Emergence of Non-Pegged Stablecoins	120
5. Worldcoin's Steely Gaze	122
6. Uniswap v3 vs. The World	122
7. Perp vs. dydx	124
8. The Alchemix of DeFinance	124
9. The Fat Applications Thesis	126
10. Tokenized Funds & Index Co-Op	128
11. DeFi's Split Personalities	129
12. The CeDeFi Boom	130
13. Governance Snafus	131
14. Security & The Dark Forest	131
15. Bullish Unlocks & FDV	132



In the first chapter of this section, we covered the core building blocks of Web3: NFTs (identity and unique digital asset primitives), the blockchain-registered “lands” of the metaverse, and the decentralized hardware networks that will host it all. The next three chapters, then, are all about how we manage the virtual worlds’ financial systems, scale their infrastructure to accommodate billions of users (human and machine), and govern them over time.

We’ll start with developments in the decentralized financial system (DeFi) as there has been a ton of new development this year despite most DeFi blue chips living through a relative bear market (many are down 80% or more vs. ETH YTD).

Before we dive deep into DeFi, let’s start with the currency that bridges us from the old world to the new...Tether.

1. The USDT Bridge

Much to the chagrin of [Bitfinex’ed](#) (RIP) and short-sellers everywhere, it’s unlikely that Tether will fail or put an end to this crypto bull market. If that were to happen, the death of Tether’s USDT would much more likely come at the hands of a US Government seizure than a bank run from the company’s depositors.

With Tether, things are never quite as they seem, so I get the mainstream confusion. It’s actually pretty simple, and I’ll reiterate last year’s entry on Tether:

“Tether’s de facto boosters (major global crypto exchanges and market makers) are likely to gloss over USDT’s risks in the absence of obvious replacements to the near-universally accepted dollar-denominated reserve. The muted market impact of this year’s [settlements (NYAG & CFTC)] may have lulled some to conclude the worst case scenario in Tether would be an orderly move into other stablecoins. But it’s one thing to send money from one platform’s perpetual contracts to another’s [like we saw with BitMEX last year]. It’s quite another to port seized dollar reserves to new banks.”

Tether is the ultimate digital eurodollar, and a lot of people trust USDT not because they have done business with Tether at scale (though many have), or because they believe the USDT reserves are fully backed (at times, they haven’t been), or because they are comfortable being complicit in a global conspiracy (nobody’s got time for that), but rather because at the end of the day they *have to* trust Tether, and the system has worked so far.

It’s inaccurate to call Tether a fraud. And it’s also a clear way to out yourself as someone who [doesn’t know what they’re talking about](#).

There’s a lot of [legit companies that work with them](#) at scale. USDT remains the reserve trading currency for most of the world’s largest exchanges and trading pairs, and [it’s not particularly close](#) - USDT is an order of magnitude more liquid than USDC or BUSD. Even [Coinbase added support](#) once it got out the door for its IPO this spring, and they’re a co-creator of USDC!

Tether has published two [audits of their reserves](#) already this year, reducing concerns that the company is running a fractional reserve. The company settled with New York’s Attorney General ([\\$18mm](#)) and with the CFTC ([\\$41mm](#)), relatively paltry sums for something that critics decry as a Madoff-sized ponzi scheme. The company’s “fib” about commingling funds after the 2016 Bitfinex hack (and customer bail-in) [paid off](#), and likely saved customers (and the industry) in the process. Would it have been better to tell the whole truth and destroy the underlying market? Yes, the company [shuffled funds around in 2018](#) to cover for the \$850 million that was stolen by an unscrupulous partner during some *insane* under-the-table Panamanian and Eastern



European banking transactions, but even that's at least partially on the US government. Tether wouldn't have had to resort to such desperate counterparty measures if US banks would take on regulated crypto customers in the first place!

I know it sounds like I'm making excuses for bad behavior, but that's not it. My point is that we all hold our noses and accept crypto's cowboy for what it is - a bridge to mainstream adoption.

CoinDesk's Marc Hochstein nailed it with his parable "[A Bridge Called Tether](#)." Tether is the most convenient, but rickety, rope bridge that spans the mountaintops of the legacy finance world and the crypto finance world. It's Shady-as-a-Service by design - less exposed to seizure risks due to the jurisdictional arbitrage it relies upon. It's also likely to get replaced at *some point* even if the terminal date remains unclear.

I think of Tether as the Omar Little of crypto. Everyone knows Omar breaks the rules, but the man lives by a code, everyone in the game respects him (even if they fear him), and regulators should know by now that when they come at the king, they best not miss. (RIP Omar.)

(Required Reading: Bloomberg [Cover Story](#). Great [Skeptic's Take](#). Omar gonna be Omar.)

**USDT's share of stablecoin market cap declined from 80% to 50% this year, but Tether's structural importance to crypto exchange settlement remains intact. USDT really should be in the markets infrastructure chapter, and USDC in the DeFi section (given its explosion as a DeFi reserve), but I didn't want to separate Paxos and USDC. I was also sick of editing.*

2. DAI vs UST

There have been numerous attempts to challenge DAI as crypto's leading decentralized stablecoin, but all have failed so far. Is this time different?

Following a set of upgrades and top tier integrations, Terra's UST - the fastest growing decentralized stablecoin of 2021 - is positioned to give DAI its strongest challenge yet. On September 30, Terra underwent its highly anticipated [Columbus-5 upgrade](#), which spawned dozens of new applications and enabled Terra to expand its reach cross-chain through Cosmos's Inter-Blockchain Communication Protocol (IBC). A new insurance protocol on Terra (Ozone) helped [add the \\$3 billion of UST](#) (via LUNA burns) to its community treasury within mere weeks. In addition, the cross-blockchain bridge, [Wormhole V2](#), launched support for Terra, bringing Terra UST to Ethereum and Solana. Momentum for UST is accelerating, as it is now positioned to become the de facto inter-chain stablecoin.

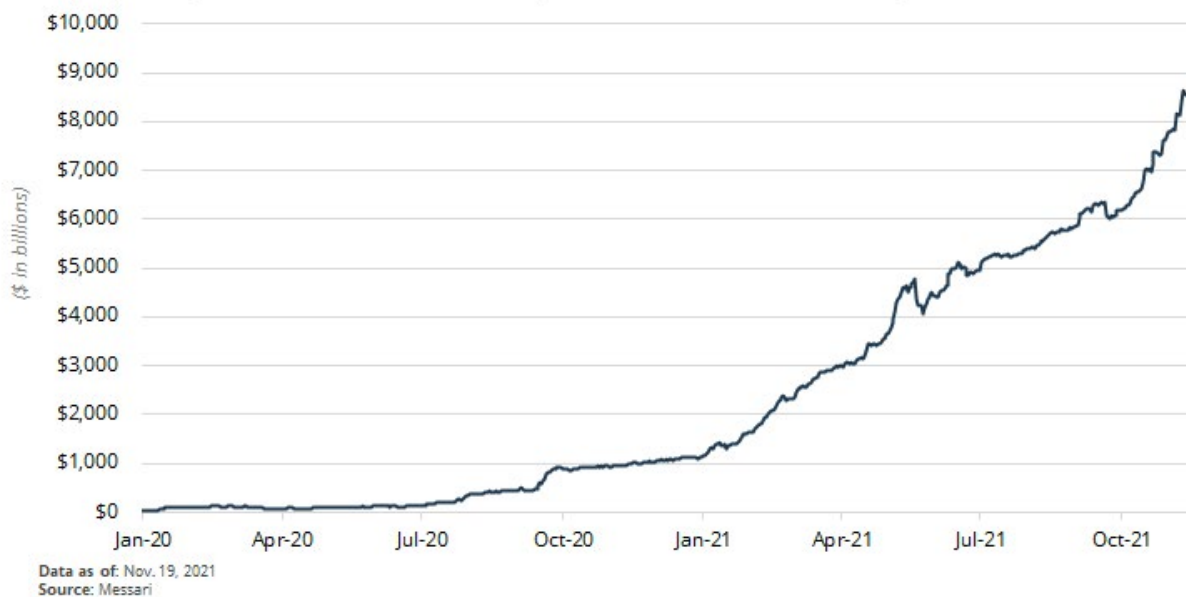
Although MakerDAO attracts criticism for its lackluster token price performance (and is generally less sexy compared to everything else happening in "DeFi 2.0"), it has never been in a better position fundamentally. Maker TVL is at an [all-time high of \\$20 billion](#), and DAI supply recently surpassed \$8.5 billion. The most impressive part of all this growth is that unlike nearly every other DeFi and stablecoin competitor, MakerDAO has provided no incentives to use its platform. All of its growth has been organic.





DAI Supply Growth Surpasses \$8.5 Billion

Despite providing no token incentives much like its competitors, DAI continues to be the leading decentralized stablecoin



Despite its new competitors, DAI is still the most widely integrated decentralized stablecoin in the industry and the preferred decentralized stablecoin of Ethereum's DeFi ecosystem. That's thanks in large part to its four year track record of stability. If the most important attribute of a stablecoin is survival, DAI stands in a league of its own. It's survived multiple brutal drawdowns and proven its resilience, something competitors can't replicate so easily.

Dai vs. UST comes down to Ethereum's DeFi dominance. One thing UST has in its favor is that it's not even trying to compete with DAI on its home turf. Instead, UST is building its own ecosystem on Terra and aggressively expanding multichain. If crypto continues evolving to a multichain future, the winning decentralized stablecoin may be the one that proliferates across the broadest ecosystem of blockchains. Terra is marching in this direction while DAI continues to serve primarily as an Ethereum reserve.

There's plenty of room for both.

3. The Algorithmic Stablecoins Renaissance

Following a mini hype cycle in Q4 2020, algorithmic stablecoins crashed violently and entered a long trough of disillusionment early this year. But we're seeing a renaissance in the sector today, powered by two new innovations: fractional reserve stablecoins and "protocol controlled value."

First though, what do we even mean by algorithmic stablecoins?



Here's an excerpt from a [thematic research piece](#) we published on the sector earlier this year:

"Most first generation algorithmic stablecoins trace their origins to a paper written in 2014 by Robert Sams titled "A Note on Cryptocurrency Stabilisation: Seigniorage Shares." Sams described a stablecoin model which involved two tokens: a stablecoin and a token that shares in the system's seigniorage (profit from new issuance). When demand for a stablecoin increases, the price of that stablecoin rises above \$1.00 (expansion) and the supply of stablecoins must increase. New issuance is distributed to "shareholders" until demand is met and the price comes back to the \$1.00 equilibrium. The opposite happens when demand falls. When the price of the stablecoin falls below \$1.00 (contraction) stablecoins are removed from circulation through a burn mechanism in exchange for the issuance of new seigniorage shares. What this model does is effectively bifurcate the system into a speculative asset that absorbs volatility and backstops the system, and a stable asset that is the object of stabilization."

This sounds simple and effective on paper, but brings up two obvious limitations: downward reflexivity can create "bank runs" on these protocols, and the lack of collateral backstop means the bank can legitimately go to zero.

Reflexivity propelled early experiments (ESD, Frax) to great heights, then annihilated them on the way down. Seigniorage shares in these systems are only worth something if buyers believe in the ongoing viability of the systems and the positive net present value of their future monetary supply. When heavy redemptions hit quickly, it crushes confidence and chills reinvestment in the share tokens, causing a death spiral.

Without any collateral backstop to offset the spiral, algorithmic stablecoins are dependent on outside "lenders of last resort" to bail them out during severe contractions. Users (bag holders) need to step in to save the system, or the shares and stablecoin will fade to oblivion.

Then there's the bootstrapping challenge.

You need to reach a sufficient level of market capitalization and bootstrap enough liquidity to ensure fluctuations in demand won't cause significant volatility in the stablecoin. However, in the absence of genuine early demand for a given stablecoin, you need to manufacture that demand through incentives to speculators. That speculation fuels reflexivity, but the more reflexive a stablecoin is, the less stable and useful it is, and the greater the perceived risk of a future liquidity crisis in the protocol.

Fractional reserve models and "protocol controlled value" have changed the calculus for algorithmic stablecoins.

Fractional reserve stablecoins (pioneered by Frax Protocol) build upon the idea that there is a sweet spot between overcollateralized and pure algorithmic stablecoins that allow for a scalable, capital efficient, decentralized stable value asset. The fractional reserves dampen reflexivity during periods of contraction, offering stablecoin holders 1:1 convertibility between stablecoins and underlying collateral, and generally provide greater confidence in the peg compared to purely algorithmic models. In the year since Frax's launch, it's reached \$1 billion in circulation, and has maintained a tight peg throughout the year, including the May crash.

Protocol controlled value (PCV) was pioneered by Fei Protocol, which functions similarly to a giant MakerDAO vault. What makes Fei different is that its *protocol* owns the assets users deposit to the system, not the individual LPs of the vault's collateral. FEI is not a loan against collateral so much as it's effectively a sale of collateral assets in exchange for a stablecoin. The system features two assets - Tribe (a governance token that can provide a backstop in "bank runs" similar to MKR) and FEI (the stablecoin). Fei is able to



do virtually whatever it wants with its treasury assets (much like a depositor-governed bank) once they are deposited. Fei can deploy balance sheet capital into lending and staking pools across DeFi or buy other reserves. That flexibility has created organic demand for its stablecoin and reduced reflexivity (so far).

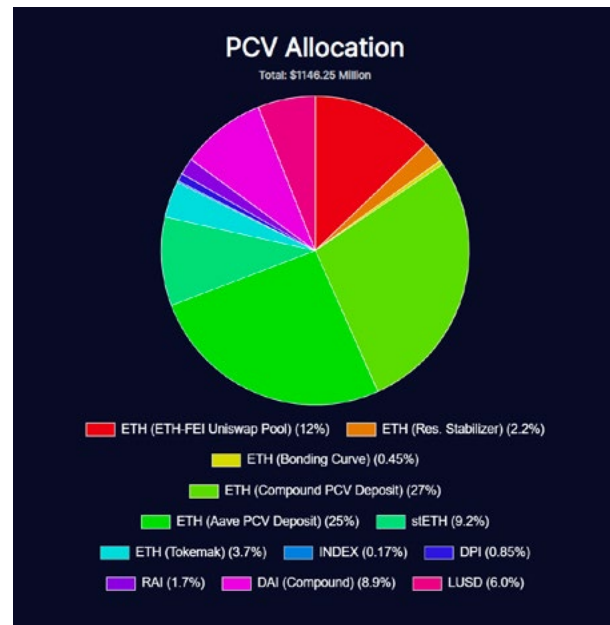
It's unclear if these improvements will be enough to challenge DAI for decentralized stablecoin supremacy, but the iterations in Fei and Frax seem like a step in the right direction.

4. The Emergence of Non Pegged Stablecoins

When bitcoin was born, it captured the imagination of its early adopters who began to seriously consider the potential for non-sovereign digital currencies.

Bitcoin's promise as a currency was long-term - it would likely remain volatile for a long time, but its believers thought it would eventually stabilize once it built its user population and liquidity. To this day, bitcoin remains incredibly volatile - it plunged more than 30% *in a single day* this May despite its \$750 billion market cap - and it's unclear whether BTC will ever achieve stability given its inflexible supply.

The builders of the crypto economy aren't waiting for bitcoin to stabilize. To bridge the gap, we've witnessed a rise in dollar-pegged stablecoins that solve crypto's volatility bug and catalyze adoption for blockchain applications beyond HODLing. But early iterations have presented a new problem - stablecoins have [dollarized](#) our blockchains, and have put the entire crypto-economy at systemic risk in the process. A currency ultimately pegged to and controlled by the Fed and Treasury, limits our ability to build a truly sovereign monetary system.

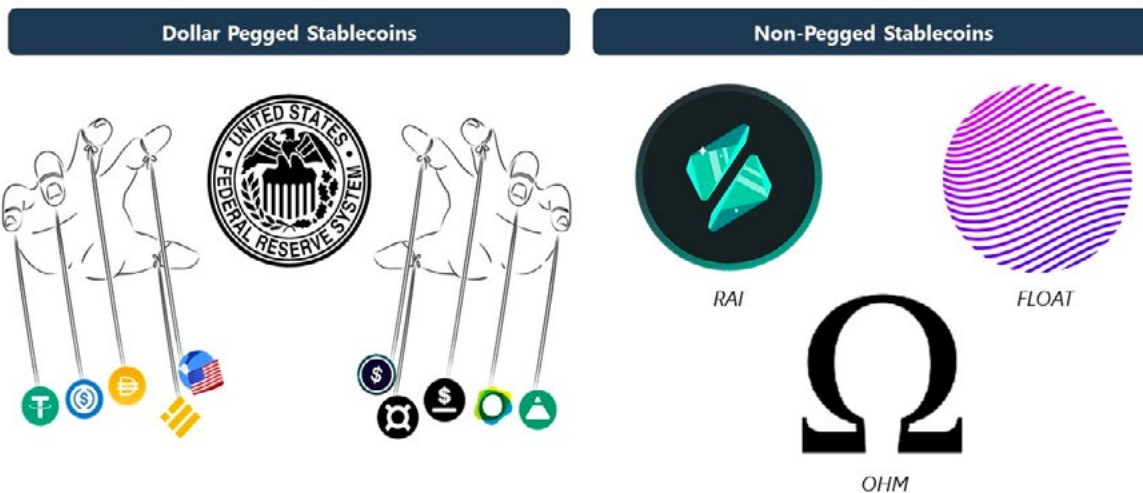


Source: [Fei Website](#)

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What If Stablecoins Were Independent From Fiat Monetary Systems?

Centralized or decentralized, the value of dollar pegged stablecoins is ultimately controlled by the Fed's monetary policy. Non pegged stablecoins offer an independent alternative more in line with the Cypherpunk vision of independent crypto money



That's what led to the launch of a new wave of projects this year, aimed at creating free-floating stablecoins which are unpegged to fiat currencies. Non-pegged stablecoins offer an opportunity for the crypto economy to achieve stability while eliminating its dollar dependence.

The controversial, but indisputable leader of this movement is [Olympus DAO](#). Launched in March 2021, Olympus incentivizes users to "bond" tokens (Dai, ETH, LP tokens, etc.) to its protocol *permanently* in exchange for a new token called OHM. The protocol attracts liquidity by offering OHM at a discount to the value of the collateral received, though newly issued OHM can only be redeemed at par value after a vesting period. The game theory has been powerful so far - in eight months since its fair launch, Olympus has accumulated \$700 million in treasury assets, and rocketed to \$3.5 billion in market cap.

Olympus DAO is now a behemoth with a hand in [multiple](#) sectors of DeFi, as it's realized a significant premium thanks to the faith its users have in the protocol's ability to conduct effective monetary policy at scale. If Olympus DAO were to accrue a treasury worth tens of billions of dollars, it might have the resources to stabilize a \$100 billion non-pegged stablecoin, much like how central banks around the world stabilize their own currencies.

Central Banking on a Blockchain

Just like how central banks manage their currencies using reserve assets (i.e USD, Gold, etc), Olympus DAO manages \$OHM using reserve assets



Visual by Daniel Cheung

Source: [Daniel Cheung](#)

If all this sounds weird to you, you're not alone. Non pegged stablecoins are undeniably a lot to wrap your head around and deserve skepticism. There are [ponzi-like game theory attributes](#) of the protocol that drive interest and participation, and it's unclear how those will hold up amidst a broader crypto selloff. However, judging by the number of forks it has spawned, OlympusDAO may be the year's most important new project, and non-pegged stablecoins may be the best bet this industry has when it comes to de-pegging from the US dollar.

(Required Reading: [The Art of Central Banking on Blockchains: Non Pegged Stablecoins](#), [Mount Olympus: Fact and Fiction](#), [Olympus Pro: Protocol Owned Liquidity as a Service](#))



5. Worldcoin's Steely Gaze

Worldcoin launched this fall with some impressive backers and an audacious goal: get a fair launched digital currency into the hands of 1 billion people by tying their retinal scans to a unique verified identity. They use zero knowledge cryptography to secure the identities on-chain, and an incentivized network of "Orb Operators" to onboard new users \$10 at a time in return for looking into the metal scanners. The [early results sounded impressive](#).

Look, I know this sounds bad.

Yes, it involves a metal iris-scanning orb built by the folks working on OpenAI.

Yes, the goal is to airdrop a new world currency and 20% is owned by wealthy seed backers.

Yes, the onboarding model relies on door-to-door techno-mormons getting paid \$10 per convert willing to store their biometrics on these new devices.

Yes, the manufacturer's name is undisclosed, and that could end poorly.

Yes, the orb does look like the death star on its side, but with a fresh wax, and an eye-scan eligible digital currency was also the currency of the galactic empire (I think).

But, what if it works?

As [Balaji pointed out](#), "*FaceID scans hundreds of millions of faces per day. Can we articulate a difference between that vs Worldcoin, or any similar opt-in technology for proof-of-human? If you run any service with more than a few trusted users, you'll immediately discover the need for some kind of proof-of-human. Not necessarily the state's old-fashioned and bureaucratic KYC impositions, but *something*. Otherwise you'll have bots, frauds, trolls, fakes, etc.*"

In his mind, and the minds of the backers, you want to be able to distinguish good users from bad ones, to protect community members' identities and privacy while also powering the new pseudonymous economy. That means "Progressives discover that you can build stateless money. Libertarians discover that you then need to rebuild something much like a state: identity, reputation, anti-fraud, custody, trust, community..."

I haven't been able to make up my mind because there will be second-order and third-order effects that we can't anticipate (good and bad) if this early experiment is at all successful.

6. Uniswap v3 vs. The World

We're going to dive a little deeper into the plumbing of DeFi now, so this section will assume you have a working knowledge of the basics. If you don't, I'd encourage you to read the DeFi chapter I wrote in [last year's Theses](#) to come up the learning curve on AMMs, yield farms, vaults, flash loans, oracles, impermanent loss, and more. This report is long enough already, so I'm assuming a little bit of prior knowledge. For this particular section, here's a [good refresher on decentralized exchanges](#) and how they work.

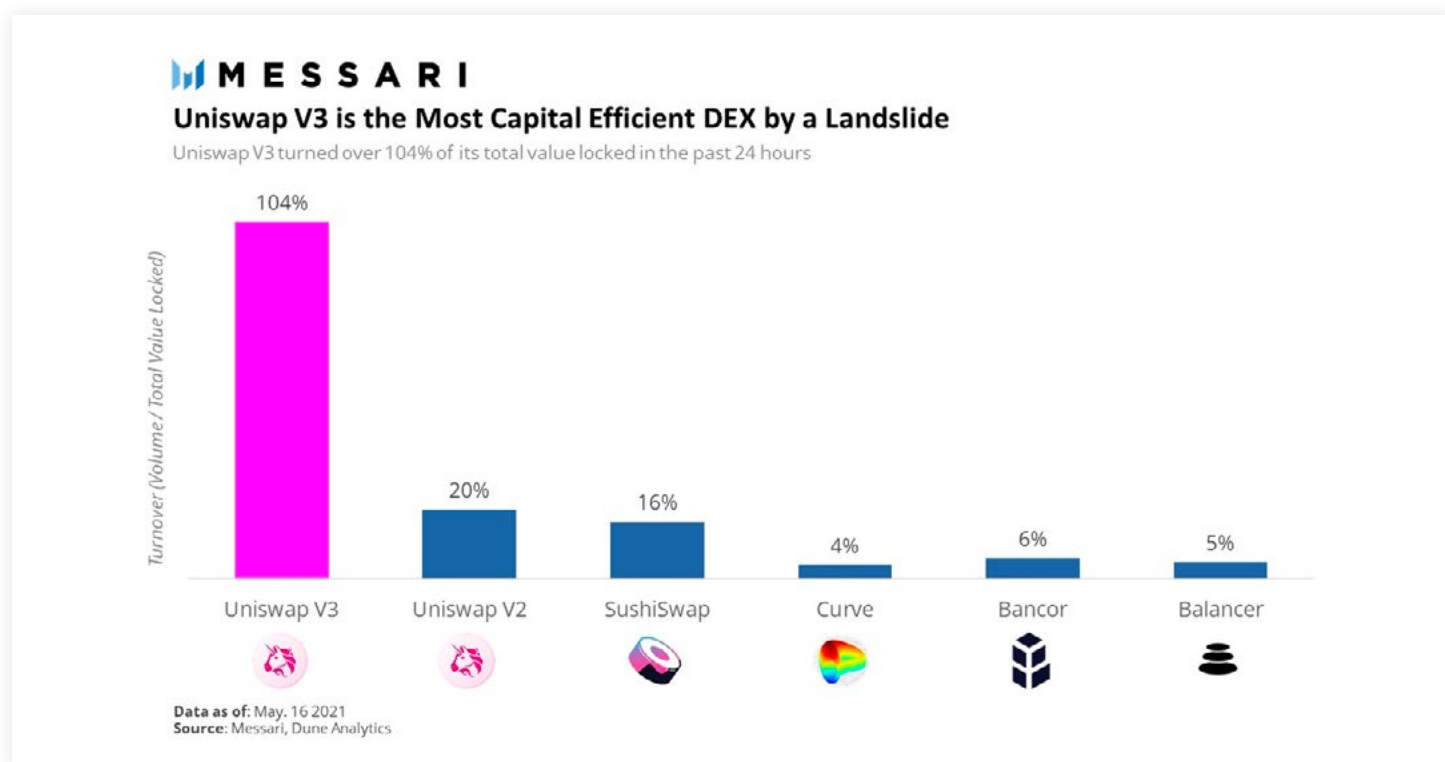
We're only going to talk about one particular DEX today, though, as some people think Uniswap v3 could eventually subsume all of the other Ethereum DEX's. They certainly have a head start, even if flattened out somewhat thanks to Ethereum's gassy, bloated chain. But most of the focus more recently has been in providing the infrastructure and tools to power more liquid markets and competitive market making. That's a smart progression as the DeFi world becomes wallet centric vs. destination centric. (Uniswap [has 3mm users](#) while Metamask has 10mm+.)



The biggest difference in v3 is that liquidity providers are active. Instead of depositing assets into a pool that passively provides liquidity along a deterministic price curve, liquidity providers actively adjust their *ranges* of buy-sell liquidity, which are then aggregated by the Uniswap AMM. Dubbed “concentrated liquidity”, these tighter ranges help improve capital efficiency by [orders of magnitude](#) through better concentration of liquidity around current market prices. They also reward professionals and [punish retail LPs](#).

V3 allows for what are essentially limit orders by market makers, and introduces customizable trading fees (30bps, 10bps, 5bps, 1bps) that incentivize liquidity providers to make new markets on otherwise illiquid pairs. These upgrades should combine to attract more professional market makers who actively monitor shorter-term liquidity positions (lazy liquidity provisioning will no longer be profitable), and help Uniswap better compete against other centralized and decentralized exchanges where it had previously struggled to keep pace due to low expected spreads (e.g. like-to-like pairs on Curve).

Concentrated liquidity is clearly the future of AMMs, and V3’s early success speaks to that. Uniswap has increased its DEX market share to 70%+ since launch.



Whether non-AMM DEX’s featuring order books ultimately prevail is something you can decide for yourself. It’s one of our most thoroughly covered sectors in Messari Pro as the spoils of success are sky high.

(Pro Reading: [101](#), [Uniswap](#), [Sushi](#), [CAKE](#), [Bancor](#), [Loopring](#), [Ox](#), [Serum](#), [Curve](#), [1inch](#))



7. Perp vs. dydx

You might have seen the batshit crazy headline in Bloomberg last month: new DeFi perpetuals platform [dydx](#) [briefly surpassed Coinbase](#) in nominal trading volumes. Yes, the early token-incentivized trading rewards helped, but this was also coming from a newer network that had carved out US customers from even using the protocol. The centralized exchanges' perpetuals volumes dominate spot volumes, and I'd expect DeFi will be no different. That makes Perp* and dydx attractive relative value plays (to spot DEXs) for the year if you're looking for a 70 IQ idea.

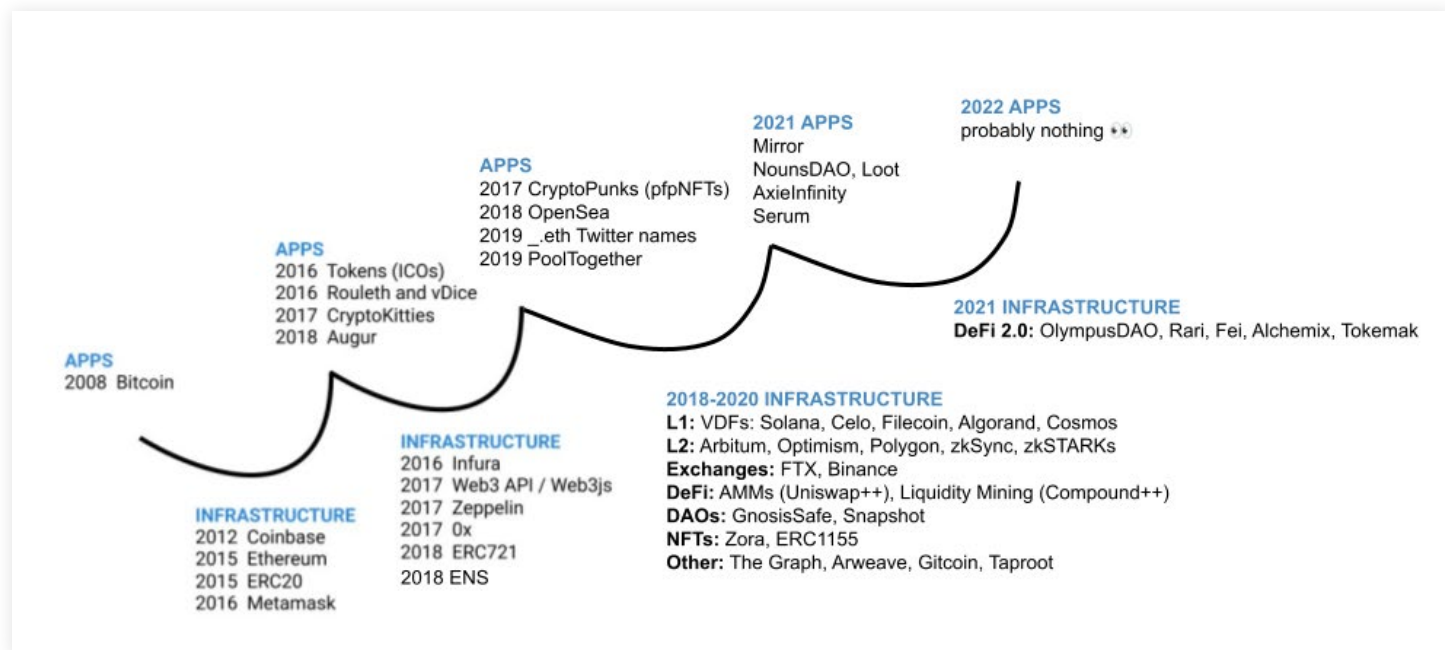
The biggest unlock this year for decentralized derivatives exchanges was the launch of L2s. Historically these exchanges were infeasible on the Ethereum base layer due to slow transaction settlement times and high cost - requirements for perps to flourish (frequent oracle updates, liquidations, etc). Perpetual Protocol grew up on Ethereum sidechain xDai and has since launched its [v2 version](#) on Arbitrum. DYDX launched on its own application specific zk-rollup earlier this year. In both cases increased transaction throughput, lower latency, and lower fees enables these types of projects to finally work.

Derivatives outside of perpetuals are a different story. They are complex, non-linear, difficult to price, and generally less lucrative given the lower demand. There are some experiments worth watching like Antimatter's "[everlasting option](#)" and TracerDAO's bull and bear tokens that attempt to neutralize "volatility decay" ([Arthur Hayes can explain](#) better than I can), but the real action will continue to be in perps, and the real battle to watch is DeFi perps vs. CEX perps.

(Pro Reading: [Defi Q2](#), [101](#), [Perp](#), [Mango](#))

8. The Alchemix of DeFinance (2.0)

The simplest breakdown I've seen of the path from DeFi 1.0 to 2.0 came from [Molly](#), but this wasn't half bad as a visual of where we are in crypto's hype and installation cycles:



The hottest family of tokens you'll hear about if you talk to anyone in DeFi circles are the DeFi 2.0 crew and anything with "protocol controlled value." [Scupy tries](#) and [Sam tries](#) to explain this better than I might, but I'll try to ELI5 here.

First, some context. The DeFi boom started 18 months ago with Compound's yield farming program. Then (and still), a preferred incentive scheme among DeFi projects has been to offer native token incentives for liquidity providers ("LPs") to the underlying DeFi protocols. This juices early liquidity in these systems, and everyone from market makers in Uniswap's AMMs, lenders and borrowers in Aave, vault holders in Yearn, etc. have flocked to the protocol's with the highest risk-adjusted returns, which include protocol revenues, and token-denominated liquidity mining rewards. These capital providers were critical during DeFi's bootstrapping period, but have diminished in value over time because they're fickle: the capital they provide is "hot" and they move from project to project. LPs are more like locusts than humble farmers, as they create a perpetual expense for protocol treasuries and relentless selling pressure.

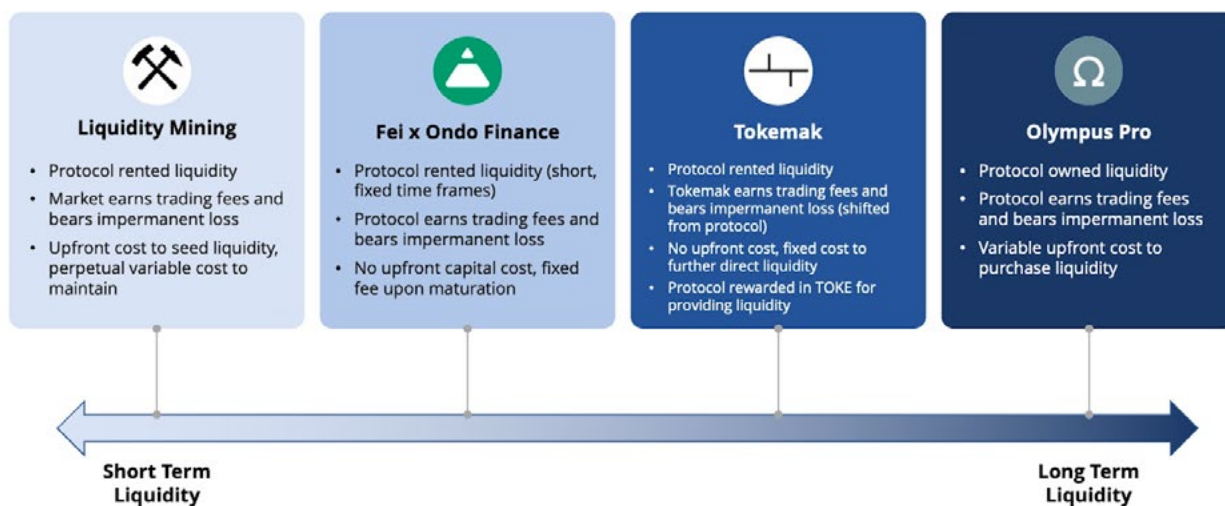
Some projects saw this and realized yield farming 1.0 was unsustainable. Instead of creating native treasury token yield farms, they began to create "Liquidity-as-a-Service" schemes that "rented liquidity" from other protocols.

We already talked about how Olympus and Fei leveraged this model. Olympus DAO pioneered "bonds" which sell native OHM tokens at a discount in exchange for Olympus' LP shares. Fei's partnership with Ondo Finance opened the door for projects to put their native treasury tokens to work in Fei as collateral assets - Fei would match contributed collateral with its stablecoin FEI in return for liquidity over fixed periods of time. Tokemak created a decentralized market maker that directly connected to the DAO *treasuries* willing to lend their native tokens to the DEX in return for TOKE. In all these cases, liquidity is now being provisioned at *the DAO level* rather than the liquidity provider level.

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The Emerging Protocol Liquidity Spectrum

Olympus Pro, Tokemak, and Fei Protocol x Ondo Finance are all solving DeFi's liquidity problem in unique ways.



Source: Messari, Joey Santoro / FEI Protocol



Protocol controlled liquidity is a subset of protocol controlled value. If protocol controlled liquidity is about DAOs provisioning *liquidity* using their token treasuries, protocol controlled value is about DAOs monetizing their balance sheets more broadly.

As mentioned earlier, Olympus DAO now has a treasury worth more than \$700 million in non-native assets, and is putting those assets to work in DEXs, lending protocols, yield aggregators, and even venture capital. That improves the returns of the DAO (its treasury assets generate yield) and reduces its cost of capital (the DAO doesn't pay external sources for its liquidity). Higher revenues. Lower costs. This is the biggest unlock of DeFi 2.0.

Beyond new models for liquidity provisioning and balance sheet monetization, this year has brought the dawn of "automaters", "enhancers", and "extenders". Automation protocols rebalance liquidity positions across AMMs and Layer 1s, recycle rewards, and provide "auto-compounding" services. Convex Finance is one the leading examples - they "recycle" \$CRV and Curve LP tokens for boosted rewards, trading fees, and governance tokens.

Enhancers are protocols that do not introduce new operating models for DeFi, but rather recycle the outputs from existing protocols to optimize returns for the end user. A good example of this is Abracadabra.money, which is similar to MakerDAO but with the important difference that it creates CDPs from yield-bearing assets (and has much looser risk controls).

Extenders are protocols that stack various underlying DeFi protocols. Alchemix is a good example. It's vaults function similarly to MakerDAO's, but the protocol also rehypothecates its collateral assets and deposits them into yield aggregators like Yearn, creating yield generating synthetic tokens which look like "self-repaying loans." The rehypothecation creates risk, as the protocol absorbs the risks of the lower-level protocols it's built on. Still, self-repaying loans!

Critics will point to subprime mortgages and other derivatives, and note that "DeFi 2.0" will have a significant garbage in, garbage out problem, with cascading failure risks. Others will greedily (and literally) invest in the [magic internet money](#) (\$5 billion in liquidity in six months). I'll be honest. I haven't yet wrapped my head around all of this yet, and whether it's all moon math or a new sustainable financial model.

(Pro Reading: [Defi 2.0](#), [Rari](#), [Alchemix](#), and [Tokemak](#))

9. The Fat Applications Thesis

Crypto is going modular at an accelerating rate. Ethereum plans to rely on a roster of Layer 2 execution platforms like Optimism, Arbitrum, StarkWare, and ZKSync. Ethereum competitors like Solana and Avalanche have developed formidable parallel DeFi layers and user bases. Cosmos has unlocked cross-chain communication, bringing its multi-chain IBC universe to life. And Polkadot's parachain auctions have finally kicked off.

In other words, the shift to a multichain future is here, and it's created a massive opportunity for existing DeFi brands to extend to new ecosystems. An Ethereum-only strategy may not be viable for those hoping to capture most of crypto's growth in coming years, when most basic transactions become uneconomical on Layer 1. When users end up on Layer 2's or competitive Layer 1's, the market for liquid, trusted financial services will reward multi-chain applications.



Most DeFi blue chips have already figured this out. Though they generally fall into four buckets:

- **Ethereum-centric:** Protocols deploy copies of their contracts only to Ethereum Layer 2s like Arbitrum or Optimism (e.g. Uniswap)
- **Spray and Pray:** Protocols deploy copies of their contracts to any EVM-compatible chain or Layer 1 sidechain (e.g. Sushi will launch anywhere...aside from Tron)
- **Targeted EVM Destinations:** Protocols deploy copies of their contracts to EVM-compatible chains or sidechains once these networks have shown some initial promise; often accompanied by a native liquidity mining program (Curve and Aave have been open-minded when compared to Uniswap, but more strategic than Sushi)
- **DeFi Hub (Independent Chain):** Protocols launch a new, standalone chain with the potential to connect with multiple networks (Compound Chain is the prime example)

There's no silver bullet. Each approach comes with distinct tradeoffs.



Source: [Kris Kay](#)

The Ethereum-centric approach aligns with the vision and values of the Ethereum faithful, one of crypto's largest and wealthiest DeFi use bases. In theory, brand recognition should enable these applications to dominate their respective market sectors wherever they deploy, which already seems to be the case for Uniswap V3 as it's outpacing other DEX's built on Optimism and Arbitrum in daily trading volume. But the Ethereum-only strategy prevents Uniswap from capturing breakthrough assets that trade on other networks.



The spray-and-pray approach usually rewards projects for being one of the first applications on a new network (increasing the chance they can corner the market in that ecosystem), and can increase gross volume and fee revenue if executed well. It requires more work for potentially negligible returns, splits liquidity, and introduces more tech debt. The spray and pray poster child is Sushi, which has launched on 14 (fourteen!) different chains. Despite the effort, 95% of its total liquidity is on Ethereum, Arbitrum, and Polygon. Sushi isn't the largest trading venue in most of its new locations, suggesting this model might not be optimal.

Targeting upstart chains once they exhibit sufficient user growth is a logical strategy. It ensures that new chains will have some organic demand, and projects can often attract incentives (Avalanche Rush) in return for their migration. Curve and Aave have used this strategy to near-perfection, as they leveraged external incentives (and their prominent brands) to become some of the largest applications on each new base layer chain they join. This strategy isn't foolproof. It's viable for DeFi blue chips, but probably not upstarts. And it's likely too reactive to effectively capture the early growth of smaller networks with [cult-like](#) communities (Moonriver).

The last approach is the most interesting - launching an independent, application-specific chain, which becomes a protocol's new home for cross-chain integrations and liquidity. Sovereign chains are chain-neutral by nature and might improve a project's defensibility (difficult to fork), token economics (proof-of-stake validation means the token has fee capture and security properties), and its potential to become a central hub for activity. The Substrate-based Compound Chain is an example of a DeFi blue chip going rogue and thinking outside of the EVM box. There's a high upfront cost to attain the technical and economic resources required to build and secure a new chain, but it might be the most lucrative path.

Chris Burniske wrote three years ago that "Interoperability of state and value is likely to place downward price pressure on layer-1 blockchains that have no monetary premium, while enabling strong middleware protocols to achieve cross-chain, winner-takes-most dominance in their respective services."

This thesis hasn't materialized yet. The infrastructure to enable seamless multichain usage is immature. Base layers have instead continued to grow fatter. But as we're now in month 16 of a [DeFi bear market](#), it's worth betting on the resurgence of the fat application thesis. I still think Chris will be proven correct - probably sooner than later.

10. Tokenized Funds & Index Co-Op

One thing I learned in reading four years of [Hester Peirce's speeches](#) one night recently (Four more years! Four more years, Hester!) was that the ETF space itself is less than 30 years old. Didn't know that. I also didn't realize ETFs account for essentially all of the growth and innovation in the fund space since 2000. The number of mutual funds has been declining, while ETFs have ascended to 20% of global AUM in open-ended funds (remainder are mutual funds).

Despite their track record of success (\$6 trillion in total net assets, lower management fees, and higher net returns for their investors), each new ETF application uses an "exemptive application process" that requires SEC permission for each new product. Wouldn't you know it! Commissioner Peirce has pushed to codify the exemptive relief standards for ETF sponsors so they can get new ETF products to market faster. She thinks that would drive competition, give investors more freedom, and allow more creativity to flourish in the ETF space.

That there hasn't been any innovation in the now \$30 trillion fund market since the birth of the internet is fairly alarming, especially for the "financial capital of the world." It's also one reason I'm bullish on projects like [Index Co-Op](#), which makes it simple to create a custom index of tokens using smart contracts. The index methodologists get rewarded for crafting and marketing new products, and are incentivized to get them



distributed across DeFi. Early examples are how DeFiPulse [monetized its index, the DPI](#), and how Bankless helped create the [BED](#) and [GMI](#) tokens. All with pretty basic market cap weightings to boot.

This should be the tip of the iceberg.

To illustrate how much customization we could see in the crypto index space, consider the credit ratings agencies and the ~~w~~ ESG ratings “agencies.” Moody’s and Fitch may have helped cause the great recession with their pay-to-play consistency on subprime mortgages, but at least they followed a similar rubric. The [ESG providers are all over the place](#). There’s no common methodology or standard for sustainability, and each provider simply provides a subjective lens through which to view “responsible” investments (likely based on the decreed politics of the day but I digress).

Where are the downsides to constructing more creative and subjective indices in DeFi?

There’s opportunities for [smart beta products](#), sector specific plays, portfolio copy-trades, and more. The biggest near-term opportunity could be shadow stonks, like we’ve already seen on Synthetix, [Mirror](#), UMA, etc. Consider that the “total value secured” by Chainlink oracles (smart contracts that leverage their data infrastructure) [is now \\$75bn](#), up 10x year over year, and you have the foundation for something big. Reliable oracle data, synthetic stocks, Co-Op smart contracts, all we need are CNBC talking heads for distribution, and we’re full-stack, fam.

Maybe [illegal](#), but big.

(Required Reading: [Enhancing the Token Index](#), [Index Coop & The Next Generation of Funds](#))

11. DeFi’s Split Personalities

“Defi has a dirty secret. While the smart contracts themselves are fully decentralized, developer teams still have substantial control over the user through their control of the frontend. We’re excited to be announcing Homescreen, a new application on Skynet that allows users to fully decentralize their web3 frontends.”

- [David Vorick](#), Skynet

We know from this summer that authorities are generally not fans of DeFi. My guess (as you know from Chapter 4) is that things will get worse before they get better, and we’ll see a bifurcation of DeFi into CeDeFi (known teams), and AnonFi (pseudonymous developers). More often than not, the split will be on front-end tooling, not protocol-level hindrances.

We watched Uniswap Labs [delist certain tokens](#) from its front-end in an apparent nod to external legal pressure. Then 1inch (which had criticized other projects for not holding firm on DeFi’s ethos in the past) [geofenced US users](#) from using its front-end and noted they would soon launch a 1inch Pro product “specifically designed for the US market and for global institutional investors in accordance with all the regulatory requirements.”

When the front ends of popular DeFi products tie to centralized DNS or ENS names controlled by the core teams it creates censorship risk *and* security issues (some front-ends can insert malicious code to e.g. steal user funds). In either case, DeFi can lose credibility with regulators, who will either say “well, clearly you DO have the ability to comply with our rules, so you’re definitely a securities offerer” or “this is rife with fraud and bad for investors.”

That’s what drove Sia’s Skynet team to announce a new project called “[Homescreen](#),” a push to secure unstoppable frontends in Web3.

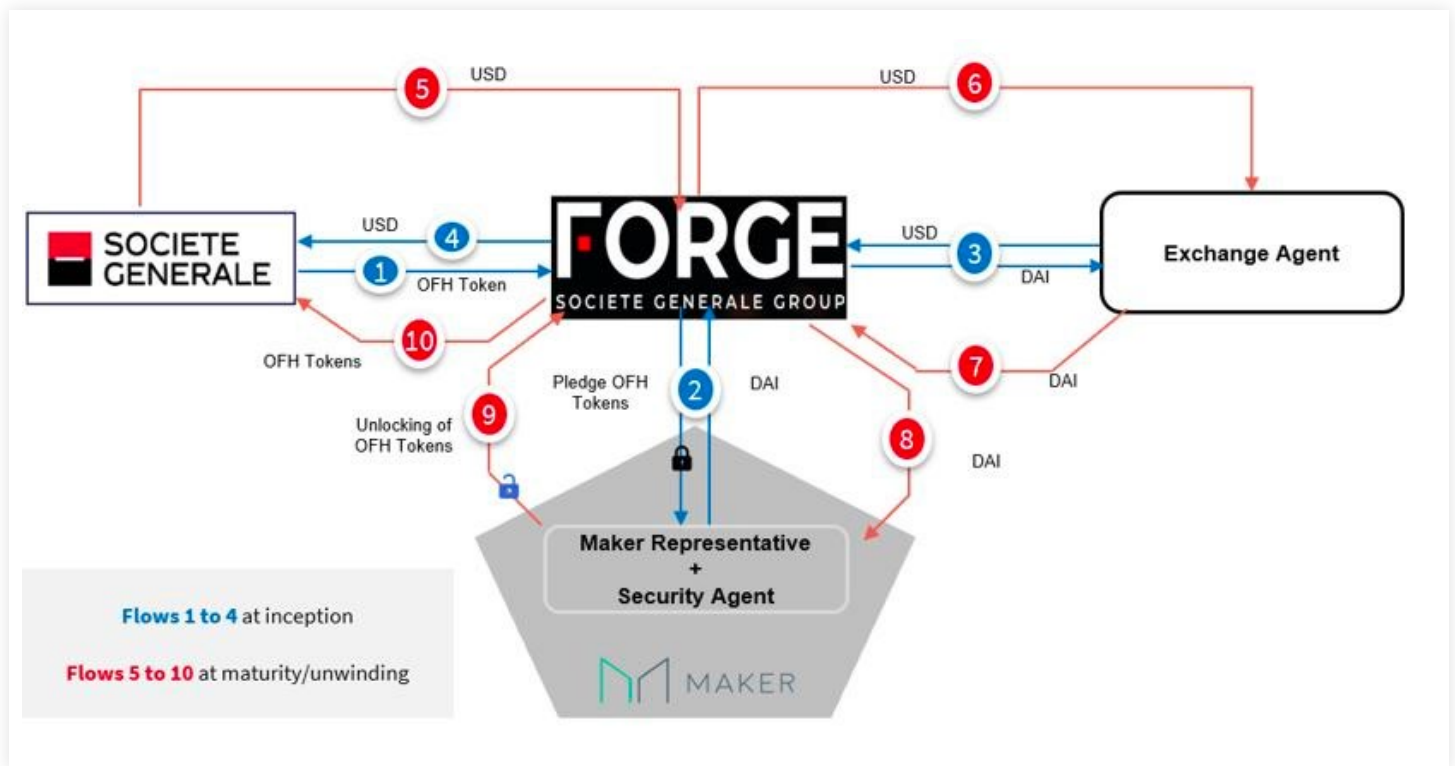


I think Homescreeen (or standards like it) will be critical in the US, as US DeFi developers get pushed to the shadows under the watchful eye of [Sauron](#). Within three years half of DeFi development may be pseudonymous, cutting edge, open research, and the other half may be CeDeFi integration points. Both are good!

In my opinion, AnonFi and truly permissionless front-ends is where we should be fighting like hell and testing the limits of code and law. No one wants to defend the developer and maintainer of a tumbling service that intentionally sells to darknet customers. We do want to defend the teenage garage hackers who are playing with magic internet money and creating new primitives for global finance? They're heroes. Screw the haters.

12. The CeDeFi Boom

One of the most mind-melting things of the year happened when French banking giant Societe Generale submitted a public proposal through MakerDAO's governance forum to have [their new bond tokens approved as collateral](#) for \$20 million in Dai. This is the bull thesis many of us had in our bull case for ubiquitous public blockchains, that institutions would do what they had previously done in peer-to-peer lending marketplaces and enter the space when it was legal and sufficiently liquid to do so safely. That doesn't make this flow chart any less maddening:



SocGen is hardly alone. We had EY gear up to launch permissioned [Polygon chains](#). The deliciousness of R3 spinning up a [DeFi token](#) on Ethereum. Visa's plan to build a "layer 2" stablecoin network connecting public blockchains and future central bank digital currencies looks [more ambitious than anything else](#). It's the sort of thing we should be shouting from the rooftops, because it normalizes stablecoins and fluffs central bankers at the same time. ("Oh we're just keeping this seat warm for your CBDC. Don't worry. [It's not like that with USDC](#).")



As [Stani said](#), “institutions are still practicing before aping into DeFi.”

My bet is that the majority of DeFi users and volume are KYC'd within the next couple of years. That seems positive (and arguably the only sustainable medium-term path), and it could open things products like fractional reserve banking and offchain credit scoring (tbd if we want those things). That still leaves the question of whether institutional entrants to DeFi will tip protocol governances so firmly in the “regulated” direction that projects begin to fork in compliance code at the core level and turn into [walled gardens](#). Don't tell me this is FUD and also tell me that proof-of-stake systems are resistant to the majority rule's coercions. I'm not saying I like this potential future, just that it seems like a non-negligible risk.

13. Governance Snafus

Compound is sort of responsible for the entire DeFi farming craze and bull run these past 18 months, so I suppose we'll give them a pass on the colossal oooooof of accidentally sending [\\$160 million worth of tokens](#) to users this fall during a routine protocol upgrade, then scrambling to reclaim the tokens through a series of [offsetting governance proposals](#). To the community's credit, they got a bunch back.

They weren't the only ones with issues. Uniswap took flak for its \$20mm no-strings attached grant (read: no minimum holding period) to the DeFi Education Fund, which resulted in a quick 50% sale of UNI for USDC. The community doesn't want to be dumped on sers, even if you're spending the dollars on [really important policy work](#) (as designed) given DC politicians still prefer greenbacks. Crypto analytics firm Flipside saw this and said, “hey, we won't dump on you, just give us \$25mm in collateral for “community enabled analytics” and we'll HODL, stake, and make money off the float.” Pretty clever, but alas, that too [drew controversy](#) (from an angry competitor) and the proposal failed. (a16z had a good [nuanced “no” vote](#).)

We're going to talk more about governance in Chapter 9 on DAOs. Sit tight until then.

For now, suffice it to say that I am super mega bigly bullish on governance infrastructure, improvements in protocol treasury deployment, and ongoing DAO distribution models that pay users, individual contributors, other businesses and DAOs alike. It's foundational tooling that will lead to DAOs replacing most companies.

(Required Reading: [a16z Open Sourcing Delegation](#), UCal's [Guide to Defi Governance](#))

14. Security & the Dark Forest

DeFi governance looks more like *Veep* than *House of Cards* today. Nothing sinister (so far), just earnest contributors hacking away at how to make decentralized ops less terrible. We haven't found many governance bugs just yet in the “dark forest,” but there's still plenty of contract bugs, MEV front-running, flash loan manipulation, and rug pulling to keep security researchers plenty busy at night.

User funds are frequently at risk, even in “secure” browser wallets. Exchanges get hacked. Keys get lost in boating accidents. People get SIM swapped. Protocols get exploited.* Risks compound because the [systems themselves are complex](#).

Come ON!

You are not investing in crypto for the risk-free rate. You're of above average sophistication already if you're aping into DEX-listed tokens via Metamask. And you recognize that technical risks are part of the risk



premium you sign up for. It sucks to get exploited. I hope it doesn't happen to me (or anyone), and we need to mitigate the mega-flops as best we can. But exploits *do* serve a purpose, and help [strengthen the broader ecosystem's security immune system](#), which is important while we're still building on the fringes with more risk aware end users.

There has never been a better time to be a security researcher or an insurance salesman.

We're now at \$250 billion+ in "total value locked" in smart contracts across various protocols. That's a lot of cheddar to come after. Ethereum security researchers have had their hands full enough, and now high fees are pushing more at-risk assets to brand new chains with less sophisticated user opsec stacks. Ethereum is down from [98% of TVL to 67% today](#).

Three things to keep an eye on this year: 1) smart contract insurance like Nexus* which became the first crypto insurance unicorn, but not the last I'm sure. 2) verified secure smart contract libraries and security-as-a-service. For example Forta* offers an "[enterprise-grade run-time security platform](#) that detects system-wide threats through a network of node operators incentivized to look out for foul play." In nongobbledygook, it's a central nervous system for DeFi. Stub your pinky toe or simply feel a chilly breeze and Forta's network could send that message to the right brains quickly, possibly serving as a circuit breaker in the future. 3) bullish in perpetuity on smart contract security researchers. Spoiler, I've invested in the first two, and I'm happy to invest in a samczsun ISA token if he ever does one.

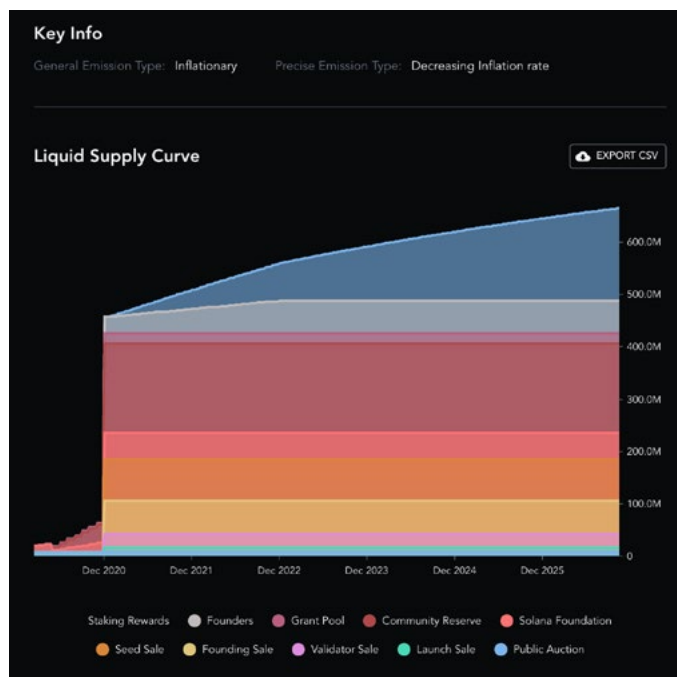
Seriously, this was the [most epic story of the year](#), and no one in the MSM picked it up. samczsun found a \$350mm bug in SushiSwap, which remember *ripped off Paradigm portfolio company Uniswap Labs' original code*, and likely saved the project and its users. He's the Mr. White Hat we need, not the [one we deserve](#).

(The bZx team holds a grudge, I think, because I quipped the project was a "bug bounties as a service" in last year's Theses. Not super nice! But clever! Also they got [hacked again](#).)

15. Bullish Unlocks & FDV

"Fully diluted value" is a pretty crappy metric for ecosystems managed by well-functioning DAOs vs. centralized foundations. And I say this while representing a company that helped popularize the metric, used the related research to identify some pretty scandalous shit in multiple projects, and generally can't pull the trigger on buying tokens with large treasuries because I'm in the middle of the IQ bell curve. The better way to think about token unlocks is a bit more nuanced, sort of like how you'd expect a [board of directors to consider new stock issuances](#), except the board in this case is a large, distributed community.

Coinbase has 10,000,000,000 of authorized Class A common shares, but just 155,243,470 outstanding. That does not make their fully-diluted valuation \$5 trillion. (Yet.) The same can be said for many protocols.



What matters is dominion and control over the tokens. You want to know how much of a given token supply is controlled by whales. For foundations, founders, VCs, etc. it's [relevant to know their lock-ups, their position sizes, and their intentions](#). But it's not definitively *negative* to see concentrated positions across given networks. Ethereum has done just fine despite Joe Lubin's early stash, and you might like SOL *because* you know that SBF is diamond-handing 30% of the supply. (That's not true, I'm just spitballing here.)

People are starting to come around to the "[bullish unlocks](#)" meme, and use of treasury as a network [demand accelerant](#) vs. depressant. There's more trust in VCs to be professional secondary sellers on the way up, than panic retail sellers on the way down, too, so FDV likely matters more in well-distributed tokens than ones with big, long-term oriented backers.

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ETH, Layers, and Bridges

1. ETH's Q3 Earnings Report	135
2. 1559: Miners and MEVers	136
3. The Merge & Liquid Staking	137
4. To EVM or Non-EVM	138
5. Layer 1 Relative Valuations	139
6. Solana Summer Never Ends	139
7. Polkadot's Slow & Steady Rollout	140
8. Cosmos & IBC Opt-In	141
9. Terraforming La Luna	141
10. The Best of the Rest (of the L1s)	142
11. Polygon Flippens ETH	143
12. They're Optimistic	146
13. Zero-Knowledge Scaling	147
14. Build me a Bridge	147
15. Wrapping it All Up	148



Before you start this section, I want you to stop reading, go to a mirror and repeat after me:

"It isn't TBI's job to hype my project onto his top platforms list. If we didn't get written up this year, there's always next year, or Messari's ongoing research, or we will take this as an learning opportunity that in one single idiot's mind we either weren't worth covering yet OR more likely it's simply not possible to cover every single project that has exploded in the industry's largest ever growth year, even in concise subsections of a 150 page report. It's not my fault. It's not my fault. [weep cathartically]."

Now that that's out of the way, we have a lot to cover, starting with the core blockchain outside of Bitcoin: Ethereum.

1. ETH's Q3 Earnings Report

I loved [Bankless's Q3 Update on Ethereum](#). It's So. Freaking. Cool. That we can produce "earnings reports" for any crypto community without the need for any central, corporate investor relations team, and we can do it over any arbitrary time period and update it in real-time. We're talking about a 1000x improvement in investor information symmetry here.

And it's pretty fun to write about Ethereum's financial performance now, too. [EIP-1559](#) went live in [early August's London Hard Fork](#), restructuring the network's fee market and burning ETH gas fees (to the benefit of all ETH holders) in the process. Over \$1.3 billion was burned in the half quarter following the update, which helps make Ethereum look more like a high-growth tech stock to more traditional investors. How would you value a company with this growth profile?

Metric	Q3 '20	Q3 '21	Y/Y
Network Revenue (Billions)	\$321,213,004.34	\$1,961,136,715.74	511%
Value Settled	\$107,751,444,461	\$536,488,443,460	398%
ETH Staked	0	7,559,965.00	-
ETH Issuance Rate (Quarterly)	1.11%	0.79%	-29%
Value of ETH Burned	0	\$1,339,710,211.70	-
Daily Active Addresses	368,467.00	457,402.00	24.1%
DeFi TVL	9.23	\$123.90	1242%
Dex Volume (Billions)	\$48.27	\$189.16	292%
	\$13,622,000,000.0		
Stablecoins Issued (Billions)	0	68,770,000,000	405%
Money Market Borrow Volume (Billions)	\$1,279,000,000.00	\$16,090,000,000.00	1158%
BTC on Ethereum	123,500	288,234	133%
OpenSea Sales	\$4,760,692.00	\$6,757,656,242.00	141847%
L2 TVL	\$8,410,232.18	\$2,513,450,206.10	29786%
Hash Power (GH/S)	250,888.48	705,663.72	181%

(Source: [Bankless](#))

This cuts both ways, of course.



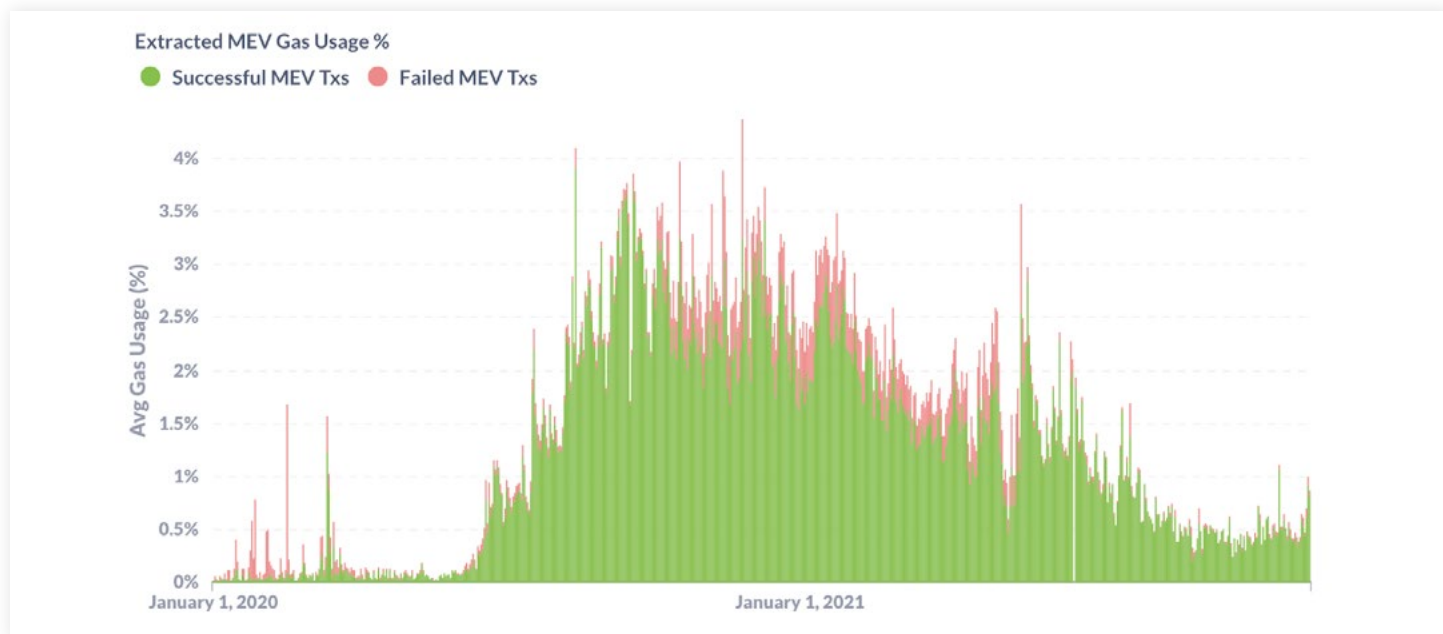
This summer's NFT mania pushed the Ethereum network to its breaking point, even as more on-chain capacity migrated to Ethereum's newly launched Layer 2's (Optimistic Ethereum launched its Alpha in July, and Arbitrum One's Mainnet launched in August). As of this writing, there's now \$330mm locked in Optimism (Uniswap and Synthetix), \$2.7bn locked in Arbitrum (UNI, SUSHI, Reddit), and \$5.1bn locked in Polygon (Aave, Polymarket, Decentraland). [DeFi Llama](#) helps track all this locked value in real-time, and that's before [factoring in throughput](#) that migrated to dYdX's zk-rollup chain built on StarkWare, where liquidity sits around [\\$1bn](#) and volumes at one point eclipsed Coinbase's.

As [Bankless](#) summarized, "there's more value locked [in Defi] than the market cap of most banks", billions of dollars were burned in EIP-1559, interoperable Layer 2s have seen adoption explode, and "The Merge" to Ethereum's proof-of-stake blockchain is in its final stages, which could further reward ETH holders with staking rewards and onboard new institutional investors who may have otherwise been hesitant to invest given their ESG mandates / mining concerns.

Not bad for a year's work. There's no obvious headwind in sight, though that can always change rapidly in a risk-off environment (given crypto's reflexivity) or if ETH2 delays or stalls in roll-up adoption continue to push capacity to competitors.

2. 1559: Miners and MEVerS

EIP-1559 helped stabilize the Ethereum transaction fee market by implementing a 12.5% "base fee shift" per block, [reducing transaction fee volatility](#), and redirecting certain "[miner extractable value](#)" [attack vectors](#). Between the London Hard Fork and the mass migration of decentralized exchange volumes to Layer 2 chains (you can get a sense for which applications are most likely to migrate to Layer 2 next by tracking this [burn leaderboard](#)), MEV dropped more than 80% as a percentage of network usage since the beginning of the year.



(Source: [Flashbots](#))



EIP-1559 also took some money out of the miners' pockets by burning base fees rather than passing them along with the block rewards. That's caused some concern over The Merge - we've never seen a switch from a proof-of-work network to proof-of-stake network at this magnitude before, but my money [is on a smooth transition](#) - at least when it comes to [miners behaving themselves](#). Two of the large Chinese mining pools have already shut down following the CCP's mining ban, and remaining Western miners (many have ties to early Ethereum investors) seem more likely to switch cleanly to staking vs. engage in a last minute powerplay. (Required Reading: [Understanding MEV](#), [Defiant Explainer](#), [A Snake in the Garden](#))

3. The Merge & Liquid Staking

Ethereum's "Merge" to proof-of-stake will radically change the dynamics of the staking market. JPMorgan even projects that staking will be a \$40 billion / year industry by 2025. But for all the benefits of the switch, staking presents an opportunity cost problem. Locking assets to participate in network validation (particularly in the year-long initial staking period) prevents these assets from being used in other parts of the ecosystem.

It didn't take long for developers to fix this glitch, and create liquid synthetic representations of all that staked capital. Right now, there's just \$10 billion in liquid staked assets, a figure which would have to grow 50x or more, if we were to hit JPMorgan's \$40 billion staking revenue threshold by 2025. It's too early to pick a winner in any of these projects, but I'm watching all of them, and am an investor in Lido and Anchor.

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Liquid staking market – The main players

Lido Finance accounts for more than 60% of the total value staked in the market

Project	Total Value Staked (\$ in millions)							
	Overall	Ethereum	Terra	Solana	Fantom	Kusama	Polkadot	Tezos
Lido Finance	6,755	4,363	2,323	69				
Anchor Protocol	2,414	314	2,100					
Marinade Finance	362			362				
Fantom	302				302			
Stakehound	223	223						
Ankr	183	183						
CREAM	82	82						
Stakewise	78	78						
SharedStake	52	52						
StaFi	34	32					2	
Karura	8					8		
StakerDAO	1							1
Total	10,494	5,013	2,323	431	302	8	2	1

Data as of: Sep. 15, 2021
Source: Defi Llama, Dune Analytics

Being able to earn staking rewards while maintaining liquid collateral opens up a number of possibilities (earn yield on your yield coins!), and while I'm long-term bullish, I'm a bit worried in the short-term about liquidation risks. 1) Bull markets don't last forever, and a delay in the Merge plus a turn in market sentiment to "risk-off" or a rotation out of ETH to other Layer 1's could create bank run scenarios in the other DeFi



protocols that lean on Lido's stETH for collateral, 2) cross-chain bridges have been susceptible to a number of hacks so far, the cross-chain availability of some of these tokens opens up a number of compounding technical risks, 3) validator downtime early on in the post-merge environment could lead to slashing, which would impact the staked tokens' collateral backing.

I'm not smart enough to handicap these risks. But as magical as DeFi is, I am old enough to know that system leverage, layers of collateralization, cross-chain availability, and an unprecedented migration of a \$500 billion network to a brand new blockchain creates risks.

(Required Pro Reading: [Should I Stake or Should I Go](#))

4. To EVM or Non-EVM?

I believe we'll live in a multi-chain world, and Ethereum's EVM will almost certainly be one of the standards that matter on a consolidated basis for decades to come. In the next few sections, I'll cover the other early leaders in the race to dominate Layer 1 (or "Layer 0"), with dedicated sections for Solana, Cosmos IBC, Polkadot, and Terra.

There's a window of time where this battle for mindshare will play out (many standards!), but you certainly don't want to be the one "[bag holding the 5th guy for anything more than a trade](#)." We may have hundreds, or thousands of application-specific "rollups" or "parachains" or "zones", but we won't have hundreds of L0/L1/L2 standards. As Ramshreyas wrote in a recent Pro piece, major tech platforms tend to trend [towards duopolies](#).

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Technology platforms trend towards duopolies

Domain	Before	After
PC operating Systems	Windows, Mac, OS2, BeOS..	Windows Mac
Mobile operating systems	Symbian, Blackberry, Android, iOS, Palm OS, Tizen..	Android iOS
Browsers	Netscape Navigator, Internet Explorer, Chrome, Firefox, Opera...	Chrome Firefox
PC Chipsets	Intel, AMD, Qualcomm, TI, Broadcom	Intel AMD
Graphics Cards	Nvidia, AMD, Asus, Intel	Nvidia AMD

Data as of: September 27th, 2021
Source: Messari



Perhaps this time will be different, but I find it unlikely that developers (particularly those working in small teams) will choose to integrate with *multiple* virtual machines outside of the top 2-3 even in the near-term, unless they have vastly superior [technical capabilities that better suit their applications](#). (e.g. Serum's decentralized exchange can only work on Solana, as its central limit order book would be infeasible on Ethereum.) Even then, many upstarts will face a choice in the medium-term between going the "safe" route in building on Ethereum's EVM, or settling new land on a tech stack that might not survive a bear market.

(Required reading: [To EVM or Not to EVM \(Pro\)](#))

5. Layer 1 Relative Valuations

In broad strokes, Ethereum's competitors are all taking different angles towards solving the "scalability trilemma" which holds that blockchains can only prioritize two out of three priorities between scalability, decentralization, and security. Vitalik and the other Ethereum core developers have already rallied around a "roll-up centric future" which prioritizes the security and decentralization of the base Ethereum blockchain intentionally over its scalability, which will be pushed to other adjacent chains. This model is similar to the preferred path of Polkadot and Cosmos. Solana, on the other hand, wants to go fast, and they're satisfied with sacrificing some level of decentralization for speed.

When it comes to the relative valuations of these projects, it helps then, to think about the size of their entire economies, their developer ecosystems, the [value they secure](#), the interoperability and incentives they offer, their value capture mechanisms, and which technical tradeoffs you believe the largest applications will choose to optimize for.

At the beginning of the year, I thought ETH's lead was unassailable. Now I'm not so sure, even if it has a number of tailwinds going into the new year. Decentralization (specifically political decentralization) and architectural soundness have become secondary properties at best and willfully ignored at worst in the mercenary dominant market of 2021. Not every new chain has tossed decentralization aside, but many have.

Even if Ethereum manages to hold off its largest non-EVM rivals, it will leak value to the rollup chains it leans on for scalability. ETH sits at ~60% market cap dominance among Layer 1s. That will either fall below 50% in 2022, or its Layer 2 rollup tokens will eat into its growth. Maybe both.

This goes back to my earlier point about *cryptocurrencies* vs. *crypto computing platforms*. Watkins [pointed it out](#) too: A crypto economy with multiple winners would look similar to the world we live in today, with five dominant \$1+ trillion technology companies. ([Full Pro piece](#).)

(Required further reading: [Algorand's commissioned report from The Block on Layer 1 Comps](#))

6. Solana Summer Never Ends

No project - maybe in crypto's history - has gotten hotter, faster than Solana in 2021. A 100x rally, a legendary challenge from one of its early critical backers, intense VC interest, an exploding infrastructure stack ([Syndica!](#)*) and application ecosystem, and a blockchain that is fast, fast, fast, make it the first legitimate challenger to Ethereum's Layer 1 dominance.

I will acknowledge the recency bias, but only if you also acknowledge the fact that Solana is *really* good at the things Ethereum doesn't even try to be good at. Solana is not trying to out-EVM and out-modularize Ethereum. It's trying to fit everything it can into its base chain.



The team is executing at a breakneck pace that was evident this month at their *Breakpoint* conference: \$100 million in investment for [decentralized social media](#) with Reddit's cofounder, \$100 million fund with FTX geared towards [blockchain gaming](#), Brave's migration to Solana as the [browser's default blockchain](#), Solana's ascendance as a potentially dominant platform in crypto gaming and [NFTs](#) (hello, FTX integration), and the recent [1mm wallet threshold](#) for Solana's browser wallet, Phantom.

It hasn't been a panacea. The network had a major, [17 hour outage](#) (or a "17 hour block" if you ask Solana founder, Anatoly) that could have led to systemic issues in its fledgling DeFi apps [had the Solana price cratered](#). But if we're calling things fairly, this isn't dissimilar to the early technical challenges Bitcoin and Ethereum faced. We often forget that this network that has amassed a \$65bn+ market cap launched fewer than two years ago. Growing pains are inevitable, and it's normal for networks to discover catastrophic bugs early in their lifecycles.

We'll see if the momentum is sustainable long-term, but Multicoin [crushed the short-term thesis](#):

"The only blockchain protocol that can [scale to 10s of millions of users] within the next 24 months—is Solana...I'm not saying that scaling via sharding and roll ups can't work. I'm actually reasonably optimistic that both solutions will, eventually. But, both of these scaling strategies don't really work today, and will create a lot of secondary and tertiary problems that have to be worked through. It's hard to see a world in which impartial organizations that demand certainty around scalability will get the certainty they need in the next 24 months because there are just so many intertwined components to scaling Ethereum."

(Required Further Reading: [A Practical Primer](#), [Solana Summer](#), [Market Map](#), [How to Solana](#))

7. Polkadot's Slow & Steady Rollout

As I discussed with founder Gavin Wood at this year's Mainnet conference, ETH 2.0 looks a lot like...Polkadot.

Polkadot bills itself as an interoperable "chain of chains" or "Layer 0" or "meta-protocol." It's designed to connect up to 100 "parachains" (for now) that will compete to share security with its core Relay Chain. We don't need to get into the technical weeds here (you can read more about how Polkadot works in our [Pro piece](#)), but just know that you should keep an eye on the protocol this month in particular as its [parachain auctions](#) are kicking into high gear now: the first five winners will be onboarded to the network on December 15, following the previous "dress rehearsal" on its test network* Kusama. (*Come at me, KSM mob.)

Polkadot is interesting for a few reasons, not the least of which is that the rollout is slow, but steady (in contrast to Solana's pace), and the development team seems to be inverting the ETH 2.0 model - rather than having applications flee the Layer 1 to work on friendlier application specific chains (ETH's rollup model), Polkadot began with a base layer that had limited execution capabilities but generalized security. The protocol outsources most functionality to customizable execution layers (parachains) at regular intervals (slot auctions), which requires contributors to buy and lockup DOTs on an ongoing basis. Add in staking and parachain bond derivatives (e.g. those on Acala), and you have the makings of a ponziomic masterpiece.

Polkadot might be moving a bit slower and steadier than the other projects in this chapter, but I wouldn't bet against someone who co-founded Ethereum, and followed it up with a second \$50 billion network.

(Required Further Reading: [Polkadot Primer](#), [Ecosystem Overview](#))



8. Cosmos & IBC Opt-In

If you haven't gotten the gist already, the "interchain" thesis has won. Cosmos was the first to work on a modular network of blockchains, and Ethereum's rollup-centric scaling plans sealed the deal. The "one-chain-to-rule-them-all" thesis is dead, and Cosmos' Inter-Blockchain Communication protocol (IBC) does something Polkadot and Ethereum don't, keeps the protocol entirely open and independent of the Cosmos "Hub" and its native token, ATOM.

The Hub is not enshrined in the Cosmos Ecosystem. It competes on equal footing with other chains that may seek to serve as a central router of data and assets across the Cosmos ecosystem in the future. The Hub's initial shared security model offers new Cosmos blockchains ("zones") the option to anchor to the Hub on an *opt-in* basis. Like Polkadot's Relay Chain, or Ethereum's Beacon Chain, but 100% optional. Cosmos treats interoperability as a spectrum, then - zones and their users choose which security risks to take on from connecting to other zones. Fully, uncoupled zones might not connect at all, while fully coupled zones might share a single consensus process.

Erik Voorhees laid out the multi-chain [narrative evolution](#) of the top platforms nicely:

Ethereum Q1: defi, decentralized, but kinda slow and very expensive

BSC Q2: defi, not decentralized, but quite fast and cheap

Solana Q3: defi, kinda decentralized, very fast and cheap

Cosmos/IBC Q4: defi, decentralized, fast and cheap

Paradigm's Charlie Noyes puts it even more simply: *"If Ethereum is a mainframe computer, Cosmos is a protocol for networking independent servers."* Chain specialization might be the only way to effectively scale on-chain activity, but Cosmos doesn't seek a premature answer to the question of how blockchains get modularized and which markets will be winner-take-most.

That's one reason it's powered two of the top 10 blockchains (Binance Smart Chain and Terra), and may include dozens of others in the future, including Ethereum.

As Do Kwon put it at Mainnet: "Maybe it's a bad idea to stick all the applications into one global computer. Maybe it just makes sense to have a multi-chain future."

Speaking of Do...

(Required Reading: [Wilson on Cosmos IBC](#), [A Cosmos Thesis \(Paradigm\)](#), [Market Map](#))

9. Terraforming La Luna

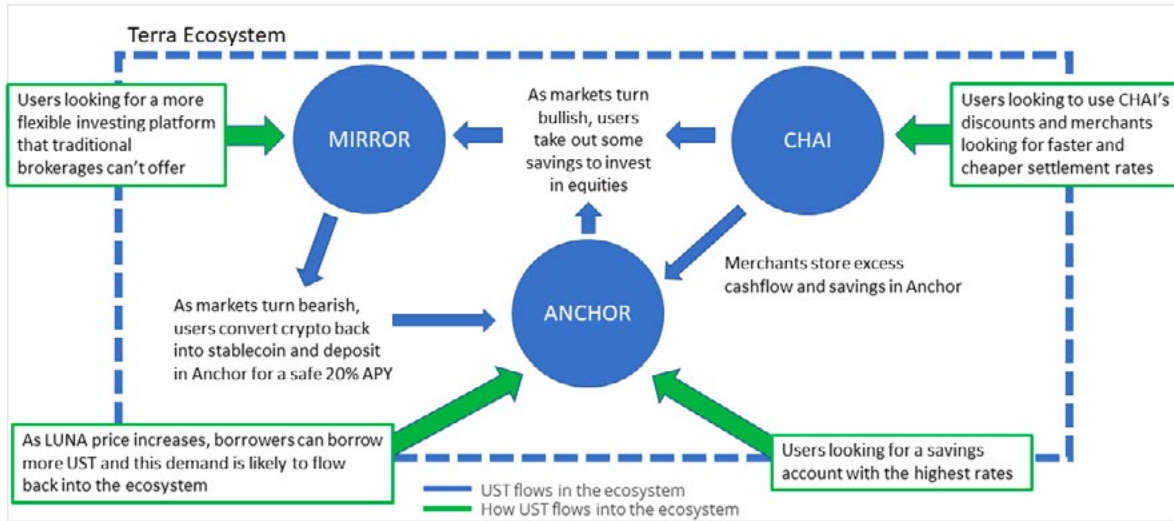
A lay person may have read the last couple of sections and thought "oh boy, this is too esoteric for me." I'm aware that I'm letting others down (see: "the best of the rest" in the next section) by not going Layer 1 by Layer 1 ad infinitum, but we're going to move on to one final "Layer 1" and then wrap here. Terra is interesting because it's a Layer 1 platform that...didn't actually start as such, but rather, emerged.

Terra's application ecosystem has exploded this year. Its partnership with South Korean payment app Chai brings Terra to 2.3 million users, Terra's algorithmic stablecoin UST has gone from \$0 to \$7.2bn in its first year and may soon overtake Maker's Dai in market cap. Synthetic stock application Mirror counts \$1.5bn in locked value, just shy of Synthetix's \$2.1bn. Terra's Anchor protocol has locked nearly as much LUNA (\$4bn) as Ethereum's Lido has ETH (\$6bn).



Ecosystem Resilience and Monetary Flow

How CHAI, Mirror and Anchor work together to ensure that inflows of UST remain in the ecosystem



Data as of: Apr. 17, 2021
Source: Messari

The biggest headwinds are known unknowns, but it's unclear whether they would prove manageable or catastrophic to the entire Terra ecosystem.

Aside from Do Kwon / Terraform Labs' battle with the SEC over Mirror and its synthetic stock tokens, there's the reflexivity of UST and its usage of LUNA as a primary source of collateral to worry about. In a full "risk-off" environment, it's unclear how resilient Terra and UST might be - during the spring dump of LUNA, UST nearly became insolvent as the value of LUNA fell below the total value of UST in circulation. It also took a \$70mm capital infusion from Terraform Labs to shore up the stability reserve at Anchor, a systemically important Terra lending protocol. The lender of last resort model works until it doesn't.

On the other hand, the protocol's [Columbus-5 upgrade](#) (which among other things connected Terra to all other Cosmos blockchains) and Wormhole v2 integration (bringing LUNA and UST to Ethereum, Solana, and Binance Smart Chain), will derisk some of that reflexivity by extending the protocol to other chains, as well as extend UST's relevance across the rest of the crypto economy. That's why I remain bullish on Terra's long-term potential. Terra's stablecoin potential alone give the project a massive TAM.

(Required Reading: [Pro Research on LUNA](#), [Anchor](#), [Terra Primer](#), [Market Map](#))

10. The Best of the Rest (of the L1s)

There are simply too many of them. I'm sorry.

Cardano is in the top 10, so this may seem like a slight, but not a single person in my network recommended I replace a section on SOL, DOT, LUNA, or ATOM with ADA. If anything, Avalanche was the first bubble team slighted for the big dance, though we'll be dropping a [big report on them](#) soon. Algorand has made



some moves recently, too, and they got [the Mooch](#) on board. Fantom has buy-in from Andre Cronje (one of last year's top 10 people to watch for his work on stablecoin project, Yearn) and [coverage from Nansen](#). Near has been aggressive, aggressive on the [grants incentives](#), and expanded its ecosystem through the EVM-compatible Aurora sidechain. Etc.

If you want more ongoing coverage of the next 10 Layer 1s that could break out and vie for supremacy (or at least major league status), you can check out more research on Messari Pro, or sponsor coverage on Messari Hub, where we're building a marketplace that connects independent analysts and projects in dire need of oxygen. We can't do it alone, no matter how quickly we're scaling our team.

You can read more on Avalanche here ([Messari, Ecosystem](#)), Algorand here ([Messari, Ecosystem](#)), Dfinity here (I can't say ICP, sorry - [Messari, Ecosystem](#)), Near here ([Messari, Ecosystem](#)), Cardano here ([Messari, Ecosystem](#)), Fantom here ([Messari, Ecosystem](#)), Elrond here ([Messari, Ecosystem](#)), Celo here ([Messari, Ecosystem](#)), Harmony here ([Messari, Ecosystem](#)), and BSC here ([Messari, Ecosystem](#)).

Even then, I know I'm missing some projects. Use the Messari search bar!!!

On to the L2s...

11. Polygon Flippens ETH

Before we move on to major players in L2 scaling, it's helpful to recap that there are essentially seven paths to scaling blockchains that we know of so far:

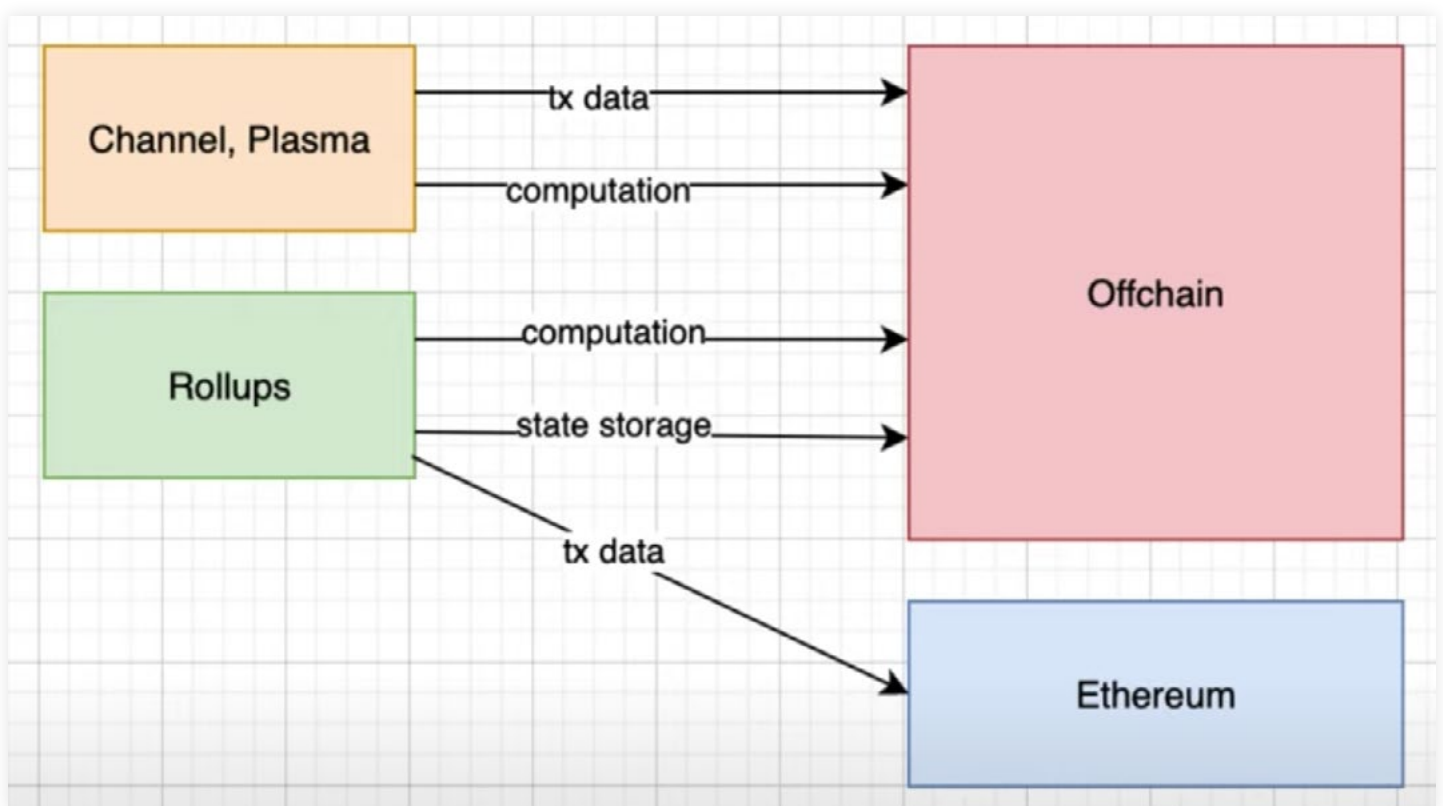
- 1. Layer 1 Optimizations:* As we saw in the directions above there are a lot of innovative approaches to scaling the core blockchains themselves. They all make different tradeoffs in the same trilemma of decentralization, security, and transaction capacity.
- 2. Layer0 Interoperability:* Ethereum 2.0, Polkadot, and Cosmos IBC all make similar assumptions that their networks will essentially be *networks* of interoperable chains with shared settlement layers.
- 3. Payment Channels:* This is what bitcoin's lightning network uses. You lock funds in a channel, and can operate with other channels that adopt the same scripts. These are usually application specific: good for payments, but suboptimal for most other cases.
- 4. Sidechains:* xDai is a good example. Binance Smart Chain is also arguably a side chain of Ethereum (or at least it could be in the future). Sidechains plug into some Layer0/Layer 1 network, and are responsible for their own consensus security models.
- 5. Plasma:* Often called "child chains" because they are essentially copies of Ethereum, these are separate blockchains anchored to Ethereum through a trust-minimized bridge system. Each Plasma chain can use its own mechanism for validating transactions, but still uses the Ethereum blockchain as a final arbiter of truth. The various Plasma designs have faced a host of UX and security issues and don't naturally support smart contract development. OMG and Polygon, for example, have since pivoted away from Plasma, leading some to suggest that Plasma is [effectively dead](#).
- 6. Optimistic Rollups:* Optimism and Arbitrum use these (see next section). Rollups are mini-blockchains that move computation off of Ethereum. They separate *state storage* (the full transaction data - stored in the rollup chain), and the *fingerprint* of that state (pushed to the Layer 1), and "optimistically" assume that the fingerprint represents the correct transaction history on the rollup. Since Ethereum stores the fingerprint, it serves as the final arbiter of truth, enabling rollups to



assume the security guarantees of Ethereum itself. It's an "innocent until proven guilty" model, where users can flag fraudulent rollup transactions during a "challenge period." While fully-EVM compatible (Uniswap, Sushiswap have already migrated), the challenge period means cross-chain transactions (like moving from Arbitrum to Ethereum) aren't instantly liquid.

7. **ZK-rollups:** zkSync and StarkWare use these (two sections from now), and dydx is live in production using StarkWare's technology. ZK-rollups are lightning fast because they use something called validity proofs, making them instantly verifiable and eliminating the need for a liquidity-sucking challenge period. They have also made strides on becoming EVM-compatible, with StarkWare's StarkNet and zkSync 2.0 sporting built-in compilers to support the execution of smart contracts written in Solidity and Vyper. But these EVM-compatible solutions aren't live yet. ZK-rollups to date have only supported a few discrete tasks like direct transfers and trading (like Loopring).

If you're lost, here's a picture:



(Source: [EatTheBlocks](#))

If you're still lost, Finematics does a great job breaking down [Layer 2s](#) and [Polygon](#), in particular. And Coin98 has a good graphic that lays out the [ETH2 ecosystem](#), and the [scaling solutions](#) in particular. Ben Simon (Mechanism Capital) is a master of [making sense](#) of rollups. You might have more 101 level homework if none of the above makes sense to you.

Onward for the 201 level students.

Polygon's rise this year has been remarkable. I'm not talking about the nearly 100x year to date rally in price. I'm talking about how effective the team has been so far in making strides to build a generalizable scaling



protocol that allows users application developers to choose between building an Ethereum sidechain, a Plasma chain, or (soon) a rollup chain.

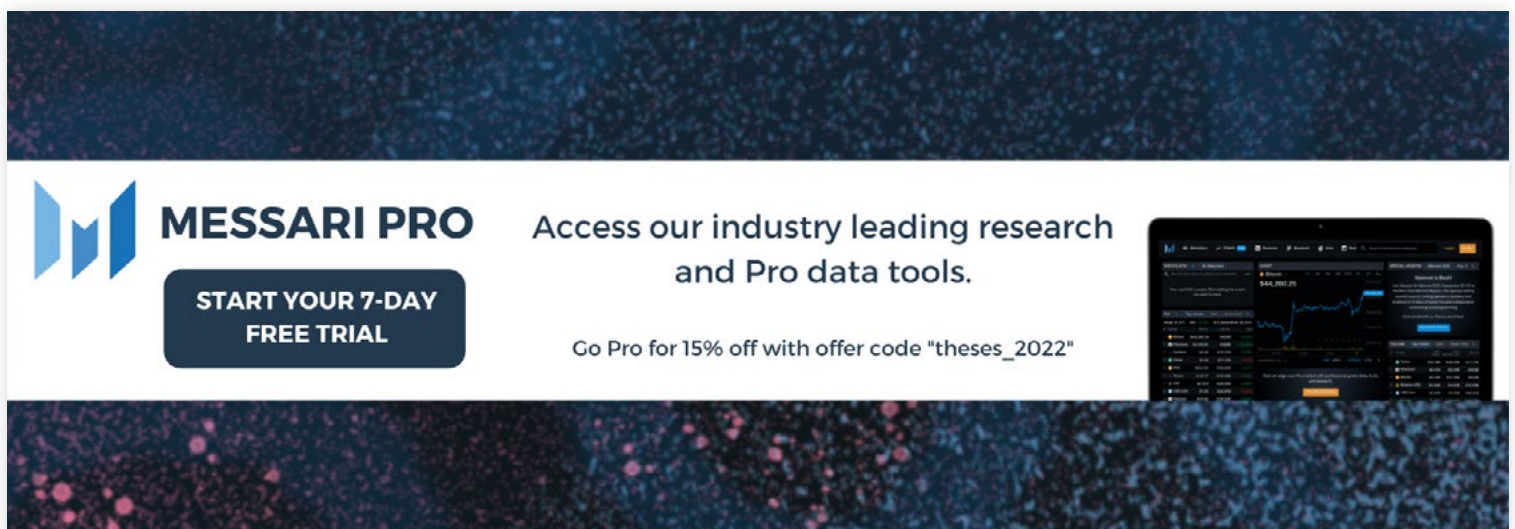
The fact that Polygon flipped Ethereum in [active user addresses](#), may be the best exhibit A we have that scaling is an existential priority for the Ethereum ecosystem. Were it not for Polygon's role in processing NFT / gaming transactions, this summer, the migration to alternative L1s like Solana may have been even more rapid.

Students of (modern) crypto history will note that Polygon is now much bigger than the initial "Matic" sidechain and Plasma solution that was launched on Ethereum. (If you see the ticker MATIC for Polygon anywhere, that's why.) Its core product remains the EVM-compatible Polygon PoS Chain and PoS Bridge, which derive their security from a group of MATIC stakers on Ethereum. This chain isn't a rollup since it has a separate validator set, but it also isn't a sidechain because Polygon validators periodically commit the chain's state to Ethereum, leading the team to characterize it as a "[commit chain](#)."

Polygon has since ventured into new territory with an array of scaling solutions and complementary tooling. Between May and July, the team introduced the [Polygon SDK](#) (a framework for launching new blockchains that could either serve as a rollup or standalone chain) and [Avail](#) (a data availability solution for Polygon SDK chains). It has also made a concentrated effort to focus on ZK technology as the long term scaling solution for the Polygon ecosystem. In August, Polygon's merge with Hermez – an open source ZK Rollup scaling solution – was a step towards integrating ZK into the core Polygon ecosystem. The team also announced a \$1B strategic fund to invest in ZK technology and revealed "Miden" an upcoming STARK-based rollup that will be EVM compatible.

On a long-enough timeline, all crypto will converge to zero-knowledge crypto.

(Required Reading: [Pro Research](#), [Market Map](#), [Finematics](#))



The advertisement banner features a dark blue background with a starry pattern. On the left is the Messari logo, a stylized 'M' composed of three blue shapes. To its right is the text 'MESSARI PRO' in bold white letters. Below this is a dark blue button with white text that reads 'START YOUR 7-DAY FREE TRIAL'. To the right of the button, the text 'Access our industry leading research and Pro data tools.' is displayed in white. Below this text is a promotional code: 'Go Pro for 15% off with offer code "theses_2022"'. On the far right of the banner is a screenshot of a financial data dashboard with various charts and tables.



12. They're Optimistic

Vitalik and the Ethereum Core developers have come around to “rollup-centric design” for Ethereum scaling that looks most similar to the designs of Polkadot and Cosmos. Settling a range of independent, EVM-compatible, execution-layer blockchains that “roll-up” to the same Ethereum Beacon Chain is already picking up steam across two different types of rollups: optimistic and zero-knowledge (ZK). (Learn more about [how they work](#) here.)

Optimistic rollups, “optimistically” assume all transactions on the rollup blockchain are valid by default. They use an innocent-until-proven-guilty model where transaction confirmations on the L1 chain are subject to a challenge period as a fraud prevention mechanism. This requires some latency between L1 and L2 transactions in order to allow for challenges, but they are EVM-compatible “out of the box”, which allows developers to port existing Solidity contracts from Ethereum’s L1 to Optimistic L2s with minimal alterations.

It’s likely that we’ll see >80% of on-chain EVM transaction volume move to L2 chains within the next 12 months. The speed of the migration will be incredible once it’s been derisked by other top applications, and the PoS Merge gets implemented in early 2021. Time is of the essence as other Layer 1s continue to gain market share (at the beginning of the year, Ethereum had 98% (!!!) of TVL. That’s down to just 66% today.)



(Source: [DefiLlama](#))

Moving quickly on Layer 2 migrations might be easier for some applications (aggregate most decentralized exchange liquidity on a single rollup chain), but for others, it will be more challenging. For example, Vitalik highlighted the need to move quickly on [cross-L2 portability](#) for NFTs this fall. Exhibit 347 that we’ll live in an abundant, multi-chain future.

(Required Reading: [Pro Research](#), [The Optimism Ecosystem](#), [Arbitrum Market Map](#))



13. Zero-Knowledge Scaling

Vitalik thinks that ZK Rollups will process the vast majority of Ethereum transactions long-term. They may also upend the thesis for alternative L1s. The most innovative tech in crypto hasn't widely impacted the markets yet, but that may change with [StarkEx](#) and [zkSync](#). ZK might be the only solution that will enable crypto to scale to billions of users, and it provides the only privacy guarantee institutions might need to participate in public, interoperable blockchains so they adequately safeguard proprietary customer data.

ZK rollups leverage zero-knowledge proofs (also known as "magic beans" to industry insiders - using this terminology will make you sound really well connected at your next meetup) to near-instantly confirm the state of their L2 chains to the Ethereum L1. Loopring, Immutable X, and dYdX are early adopters, but don't expect their success to lead to a rush for ZK rollups just yet: they aren't fully EVM compatible and require some customization to hop between the L1 and other L2s. The programmability gap will inevitably close between Optimistic and ZK rollups (StarkWare says its StarkNet is coming soon), but today the tradeoff is about simplicity and compatibility vs. settlement speed. Vitalik is probably right about ZK rollups dominating, but from a technical and regulatory standpoint, it will take time, and a LOT of education.

My bet is that L1 Ethereum transactions account for <20% of transactions by the end of next year, and Optimistic Rollups account for less than 50% of total L2 usage by the end of 2023. It's going to come faster than we think...by necessity.

(Required Reading: [Zero-Knowledge by Packy](#))

14. Build Me a Bridge

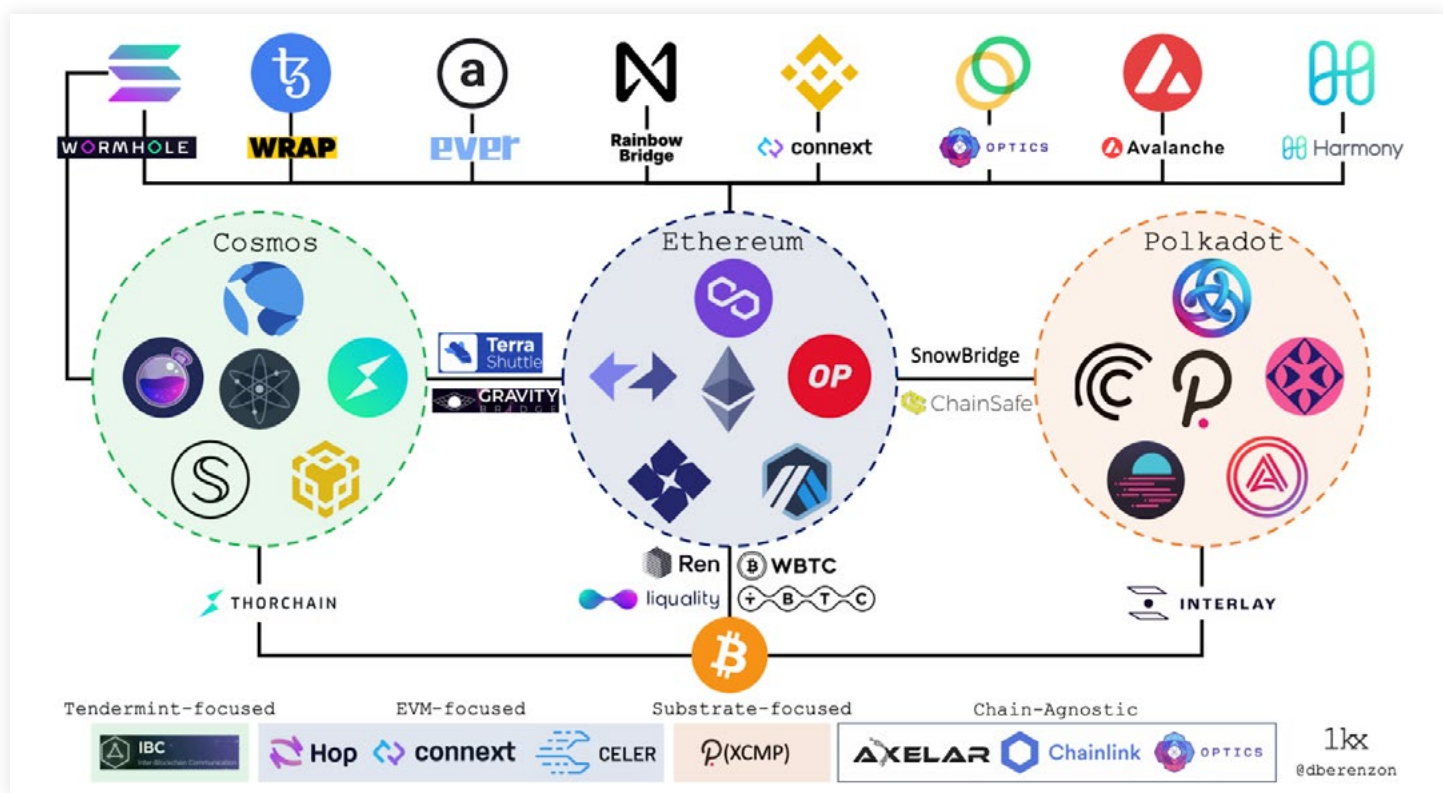
By now, it's abundantly clear that a multichain world isn't just the future, it's the present.

There are 15 blockchains today that store over \$10 billion in assets each, and Bitcoin and Ethereum store nearly \$2 trillion by themselves. Growth doesn't appear to be slowing anytime soon, and it's likely even more blockchains will rise in the coming years with the launch of Layer 2 rollup chains. In many ways the world of blockchains is quickly starting to resemble our physical world today, defined by nations which each have their own economies, governed by their own rules.

However, blockchain ecosystems remain divided. They're like isolationist nations, with limited transportation systems or international trading arrangements. Today there is still no scalable, decentralized, widely integrated protocol that moves value and data between blockchains without relying on trusted third parties. Instead users mostly rely on centralized intermediaries like exchanges and custodians to move value between blockchains, exposing them to custodial risks and seizure/censorship risks.

Luckily there are a number of teams acutely aware of this opportunity, and projects like Cosmos that have been building for this world since 2014. Dmitry Berenson wrote a great [piece](#) overviewing the various approaches to cross-chain bridges.





(Source: [Dmitriy Berenzon](#))

Just as Ethereum’s composability enabled developers to package protocols together and build new dynamic applications (e.g. Yearn depositing assets into Compound, Aave, Curve, etc, for automated yield), we’ll likely see similar cross-chain applications that emerge once the bridge infrastructure is ready and capable of unlocking crypto collateral.

Cross-chain interoperability is also likely to standardize around a small number of trusted, widely integrated protocols. The immaturity of today’s solutions creates significant user and developer friction, but a bridge that’s credibly decentralized, battle-tested, and well-integrated across Layer 1s would likely emerge as the preferred choice for cross-chain liquidity simply due to its predictability and reliability. As the multichain economy grows, it’s inevitable that cross-chain bridges will facilitate an enormous amount of asset and data transfer volume.

Prediction: the most popular L1 <> L2 / L1 <> L1 / L2 <> L2 bridge protocols will have higher daily volumes than the most popular centralized exchange within five years.

15. Wrapping it All Up

Before we get to our final chapter on participation in the web3 economy (and the future organizational structure of society), it’s helpful to take a step back, and recap the incredible breadth of innovation that’s just beginning to emerge in crypto. I loved this thread on the [23 crypto innovations](#) that will revolutionize our world. Time will tell if the markets are overheated in the short-term, but we’re just getting started in the crypto supercycle.

It’s Day 1.



The DAO of DAOs

1. Enabling Tools: Wallets & Staking	150
2. Down the Rabbit Hole: Learning & Earning	151
3. Working in Web3	152
4. Hierarchies, Pods, and Fluid Organisms	152
5. DAO Treasury Management	154
6. DAO Investor Relations	156
7. Messari: Tying it All Together	158
8. Legal Framework for DAOS	158
9. The New Capital Allocators	159
10. The New Information Curators	160



"Whereas most technologies tend to automate workers on the periphery doing menial tasks, blockchains automate away the center. Instead of putting the taxi driver out of a job, blockchain puts Uber out of a job and lets the taxi drivers work with the customer directly."
- Vitalik Buterin

We talked about Decentralized Autonomous Organizations (DAOs) a bit earlier in the regulatory section, but didn't give them their proper due. They really need a full chapter. Let's correct that and close with a bang, because DAOs are one of the most important constructs in crypto, and they will change every aspect of the economy, politics, and probably even your social life in the years ahead. If 2020 was all about DeFi, and 2021 was all about NFTs, 2022 will be the year of the DAO.

So maybe we should start by answering, what even is a DAO?

I once described them over dinner to a skeptic as "a governance structure that manages a community treasury." Not bad given I just blurted it out over herring!

More specifically, DAOs are fluid *online* communities whose assets are managed by the community's contributors. The organizing primitive of a DAO is code committed to a public ledger vs. articles filed in Delaware, and the blockchain guarantees user accessibility, transparency, and exit-rights (via forks). A DAO's token determines voting power, allocates funds according to group priorities, incentivizes participation, and punishes anti-social actions.

I also liked this [simple definition](#) proposed by the Bankless guys: "digitally native communities that center around a shared mission." Where the communities are bottoms-up, flexible, and loosely organized. They have a shared mission and protocol (on the blockchain), internal capital, and enforceable social norms, and they can be used to manage just about anything: an open-source library, an NFT collection, a social club, a newsfeed, pooled labor, etc.

Orca's* Julia Rosenberg and Maria Gomez tried to formalize the definition, too.

They [wrote that DAOs](#) are 1) open-source & blockchain-based, 2) open membership, 3) groups of independent parties, that 4) use a token to govern a protocol and 5) allocate internal capital, with the goals of 6) automating a marketplace or function, 7) preventing collusion, and 8) incentivizing bottoms up community participation.

As you can see, we're all still sounding things out! (Even more [attempts here](#).) How we talk about them will change in the coming years. But however they're defined, they're gonna be big.

(More required reading: [The Ultimate DAO Report & Presentation](#), [The Generalist](#), [A Prehistory](#))

1. Enabling Tools: Wallets & Staking

What if the past 18 months was really just the necessary precursor and installation phase of the real mega-trend, the reorganization of society around token-governed communities?

If that were the case, you'd probably need tools that help you to manage tokens securely and swap them peer-to-peer (DeFi), you'd want better ways to build and selectively share pieces of your personal identity (NFTs), and you'd want assurances that you could navigate frictionlessly across communities regardless of which tech stacks they used (L1-L2 bridges).

Ta da! Here we are.



The backbone of the Web3 economy and the wild world of DAOs are your personal wallets, which are sort of like your personal data vaults. Whether it's Metamask or Coinbase on Ethereum, Phantom on Solana, TerraStation on Terra, or something else, these tokens within these vaults unlock your access to the crypto realm, and will only become more important in the years to come. In five years, people might look at the current wallet landscape and sneer at how primitive we were, but some solutions (e.g. Zapper, Zerion) show how we're getting closer to a time when our wallets can double as universal identifiers and data managers.

Joining a new social application? Point and click which avatars you'd like to wear in the new club. Betting on a match? Use real money or keep score with your friend group's "social credit." (Opt-in, none of that CCP shit.) Applying to a new job? Selectively share the [badges that correspond to your skills](#) and accumulated reputation. All of that is going to need a front-end, and the crypto wallets getting built today, will be as integral to your life's operating system as your cell phone.

(Required reading: Packy nailed it in his post, [The Interface Phase](#))

2. Down the Rabbithole: Learning & Earning

Rabbithole* is at the forefront of one of the most exciting trends in crypto: "learn to earn."

The crypto economy is booming. User minds are melting from the pace of development. And one of the scarcest resources of all is attention and genuine user participation. Rabbithole offers quests that help users test new products and earn token treasury rewards. It's a win-win-win for all. Token teams use their treasuries (which are liquid capital resources *designed to be allocated for growth*) to [fund customer acquisition costs](#), Rabbithole gets a cut for developing the user journey, and users win. At *incredible* scale. The company estimated its users earned \$175mm in aggregate from a single quest: [registering an ENS domain](#). That's one way to get attention.

Even if the mega-airdrops are unsustainable in size, they're likely in their infancy in practice. DAOs have money...lots of it, and want users. And we know how lucrative this market can be for those willing to make the market: Coinbase Earn is doing \$60mm+ annualized in revenue in what is arguably the most underutilized part of its business.

The "learn to earn" plays will be easy to integrate into the Web3 wallets and hosted wallets alike. They're user education initiatives that pay for themselves in the form of more crypto natives, and thus, more long-term holders. Every [single blockchain](#) may have a Rabbithole, too. The world is just too big (and the communities too religious?) for this to be winner-take-all, and I expect that "quest developers" will end up being a lucrative occupation within DAO communities.

If you're in college, I'd encourage you to spend the spring semester (maybe redeploy your book budget into ETH gas fees), learning and testing different crypto protocols on Earn, Rabbithole and other places. Best case scenario, you hit the lotto on a few more airdrops. Worst case? You flunk out, and you'll get hired on the spot by a crypto company once you show them your degen score and NFT [merit badge](#) library. (Seriously: we get apps with degen scores, and we like it.)

Much like twitter > linkedin for networking. Learn-to-earn is going to slowly replace credentials and largely gamify and invert the education funding model.



3. Working in Web3

After learning a bit about a project, you might want to start diving in and contributing a little on the side. That gig work could be spread out across projects, or a pre-cursor to a full time offer from a DAO or one of its related companies. Part-time responsibilities span [DevOps](#), [Research](#), [Governance](#), [Data Science](#), and more. Both the centralized and decentralized communities are also hiring for full-time roles at a [rapid clip](#). But more than anything, DAOs may present one of the most lucrative ways to build [a portable reputation](#) that will persist across projects. Chris Dixon [compares DAO membership](#) favorably to other historical analogs:

“Like Venice did for early modern Europe, web3 is redefining how global talent pools their knowledge and work together. And like the Homebrew Computer Club in the 1970s, communities of smart, passionate, “hobbyists” are gathering in forums to tinker with a new set of primitives to build groundbreaking products and experiences. Those communities are being organized today via DAOs, the web3 group coordination primitive.”

What’s wild about the web3 ecosystem, though, is its global accessibility. You don’t need to be born in the right city or earn admittance to the right computer science program. The bottoms up model and opt-in membership of DAOs [invert the talent sourcing model](#). You can join a discord server with one click. You can earn bounties and display your proof of work to earn [reputation points](#) with the community’s decentralized HR, community vouches. You can apply for grants or submit proposals for full-time employment directly to the DAO membership.

It will be rare for people to effectively work for multiple DAOs at the same time unless it’s in a very narrow specialist role (e.g. creating data dashboards or other research reports) or back office function. For most DAOs, Hollywood will be the model. The DAO production companies provide financing, project direction, and assemble the teams. Those teams sprints on gigs, develops their personal bona fides, then disassemble, and move on to the next. The big DAOs will be sticky employers, but most DAOs (including subDAOs to the bigger DAOs!) will be more fluid. The key difference in the Web3 “Hollywood” model is that each contributor - no matter how small - can retain royalties tied to the product’s ongoing success.

The challenge we’ll have in the West is understanding whether this is accelerating offshoring and farming out white collar work to the [lowest cost bidder](#). Will DAOs worsen the poor labor dynamics that already plague other marketplace providers in the gig economy?

There’s arguably much more upside than downside. Early contributors will at least share in the upside of the platforms they help bootstrap, even if those platforms drive variable labor costs. Either way, Web3 token incentives are something that can’t be uninvented.

You’ll work for a DAO someday. Might as well get started now while the [alpha is highest](#).

(Required Reading: [Handbook](#), [Notes on DAOs](#), [The Future of Work](#), [How to DAO](#), [Full-Time DAOs](#), [DAO Reading List](#), [DAO Landscape](#) | Watch: [What it’s like to Work for a DAOs](#))

4. Hierarchies, Pods, and Fluid Organisms

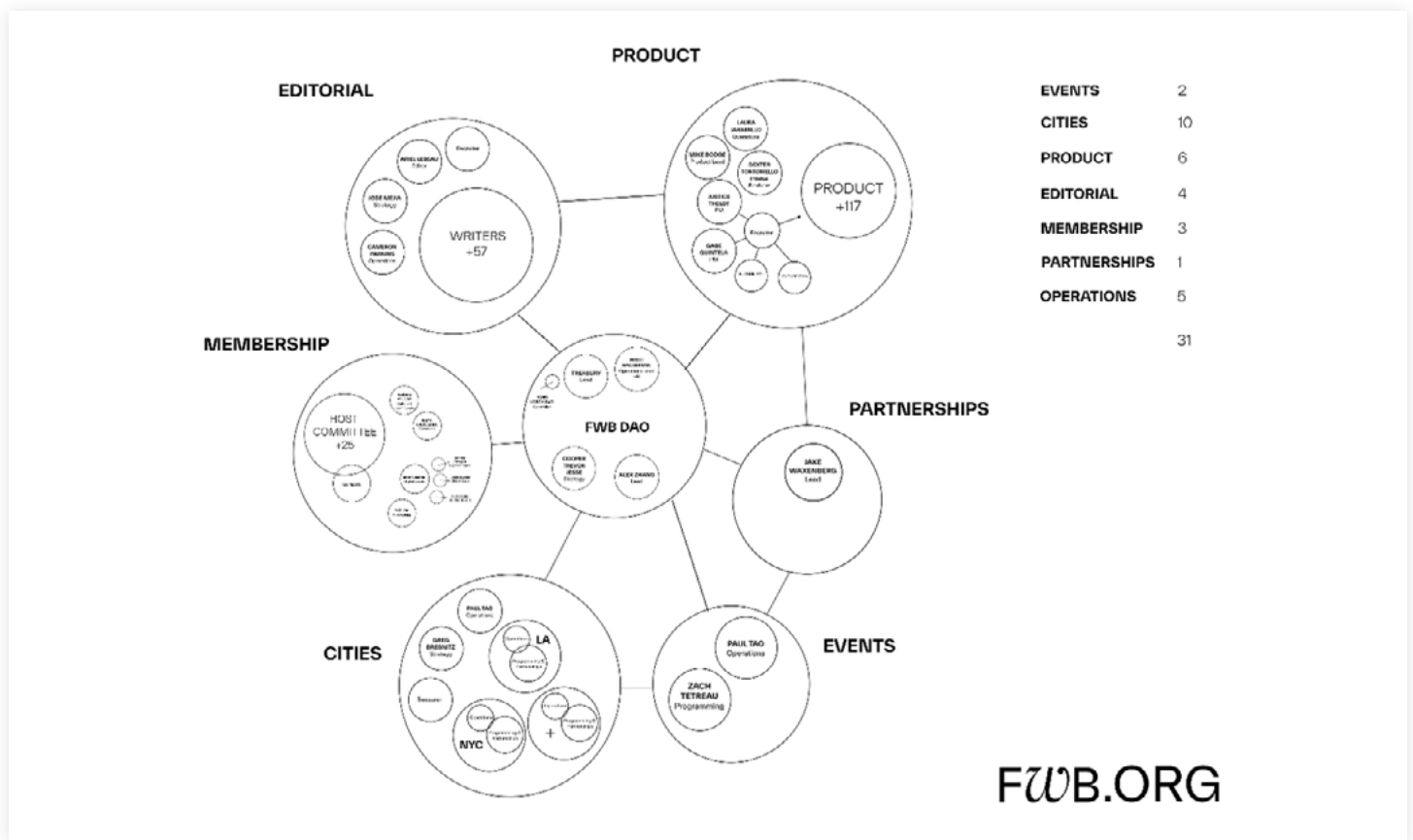
If you join a DAO, one of the first things you’ll notice is that there’s a new “CEO” in town, the connective tissue of most DAOs - the Chief Community Officer. These are people who [seize the memes of production](#), and command decentralized armies of (hopefully) net promoters. In the formative days of a project, they can usher newcomers to the right resources, set the tone and culture of a discord server, and help curate early internal and external messaging.



That should bring a few questions to mind. How do we balance between choosing new benevolent dictators and maintaining decentralized decision making? (Mario has [some ideas](#)...his canon of token governance research is a must read.) How do we solve some of the challenges of "coin voting" and voter apathy or collusion? (Vitalik would [like a word](#).)

Crypto communities have caught on pretty quickly to the fact that decision making in DAOs needs to be stratified very similarly to (gasp) traditional companies. Governance accountability, community "HR", user and contributor engagement and communications, etc. are all significant, but surmountable challenges. Jai from [Rari Capital has a good playbook](#). He suggests breaking roles into "bubbles" which allows for sub-DAOs and discrete, fluid teams, something that [Yearn pioneered and currently uses](#). I think this is the right framing, and it also pushes organizations to scale via written documentation.

We'll need to see 100x improvements in information flow and decision support tools. You can govern a global DAO or a subDAO with NFTs or social currencies more easily than you might a global corporation (anyone who's remote first and international knows what a nightmare it is to set up this infrastructure), but that doesn't change the fact that without delegated functions, progress in a DAO can move to a standstill when every micro-decision turns into a proxy vote.



(Source: [FWB.org](#))



Orca Protocol* is working on one of the cooler implementations I've seen. They leverage NFTs as access tokens that give members to a "pod" some discrete responsibilities and DAO treasury rights. It's really as simple as electing sub-committees and holding them accountable for results on a periodic basis. The oversight responsibility falls on the collective, though, and the only thing that separates good governance from bad governance in that model is good information (performance analytics) and voter incentives (to overcome apathy).

The critique is that our early DAOs actually aren't that diverse - by design they [reward the early adopters](#) and "in-crowd" first. That they formalize what we already know about governance: those with the money make the rules. Those are fair, but short-term concerns. The upgrade from today's global plutocracy is that DAO contributors and users can earn liquid political capital and delegated authority with breathtaking speed, and they can do so pseudonymously. But this is also where taxes are collected, benefits offered, and state compliance enforced. It wouldn't surprise me to see some jurisdictions make it illegal to work for an unregistered DAO as a result. Then again other jurisdictions will likely invite DAO workers with unique tax codes that account for the difficulty in extracting tax without employer and banking oversight.

It's so early in the token-governed world experiment that it almost makes my head explode. This is where Messari will be spending most of its resources going forward.

5. DAO Treasury Management

DeFi's current bull market is one of the top wealth generating events in crypto's short history. Any institution or individual with reasonable exposure to the sector watched as their net worth / balance sheet spike five-ten-fifty-fold or more in the past 18 months. Some of the top DeFi protocols themselves are now sitting on hundreds of millions, and sometimes billions, of dollars in value, mostly in their native tokens. Two of the most active DAOs, Uniswap (\$4bn) and Compound (\$1bn) sit on particularly large reserves.

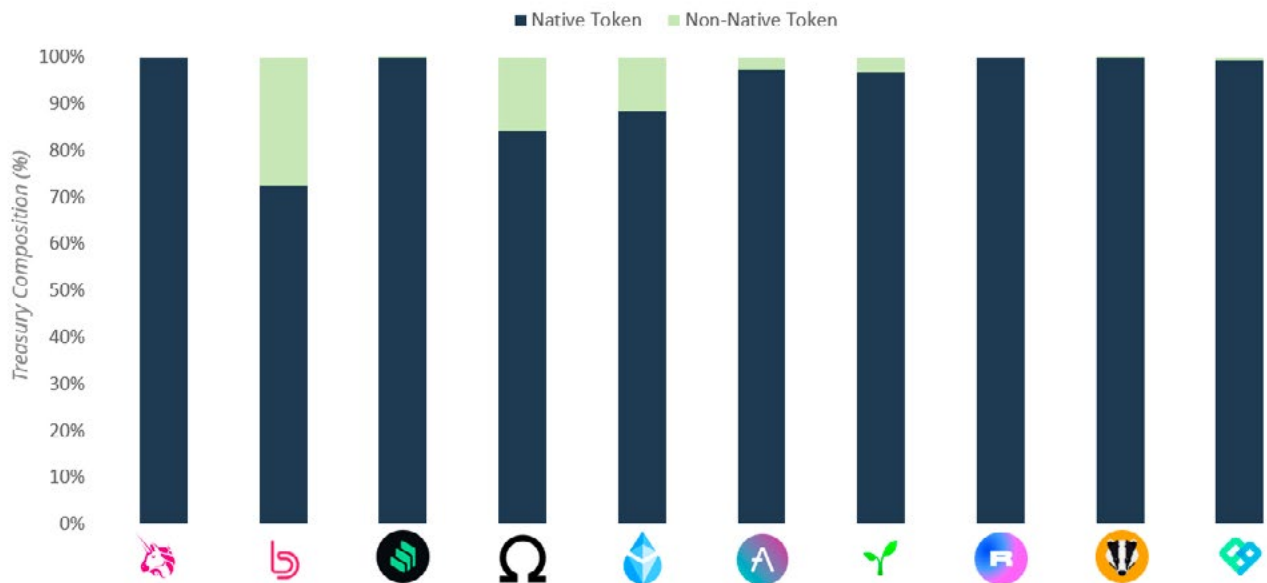
You might look at the numbers and think DeFi protocols are financially set for life, but a deeper look into the composition of each treasury suggests the opposite. The vast majority of the "value" in these token treasuries is coming from the reflexive belief that the market will always absorb the new supply. That may happen in bull markets, but things can unwind sharply when volumes subside. In fact, that's exactly what happened during May's market crash.

Still, top project treasuries haven't diversified much:



Asset Breakdown of Top DeFi Treasuries

Native token allocation remains elevated across the top DeFi treasuries



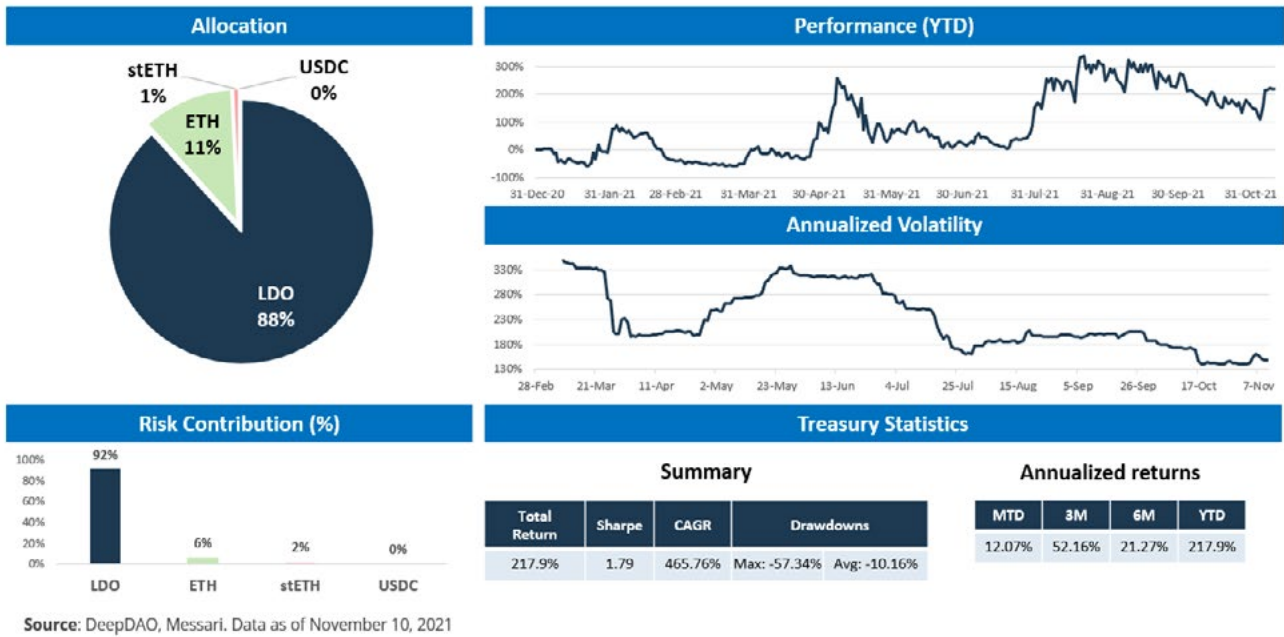
Source: DeepDAO. Data as of November 10, 2021

During Black Swan events, protocol treasuries are at the mercy of the market. Even some of the best projects that relied on these reserves in the 2018-2019 bear market struggled to survive. That’s before you consider the [idiosyncratic risk](#) of each specific asset: smart contract failures, hacks, oracle deficiencies, and coding errors can tank a token’s price even before the DAO considers remedies that might make whole impacted users. It can create a vicious downward spiral if the treasury isn’t managed properly.

Other investors have picked up on this as well, yet despite the [widely expressed](#) need for better treasury diversification in top projects, most DAOs remain actionless. There are a few reasons for this (developer naivete or overconfidence, the desire to avoid giving communities the impression a large token holder is “dumping” assets, regulatory challenges, etc.), but in many cases it simply comes down to a lack of visibility and decision making tools.

Data sources like [DeepDAO](#) are doing a good job tracking project treasuries, but don’t provide the full context that an elementary portfolio management tool could provide. Giving communities better treasury analytics could greatly improve their governance decision making process.

Treasury Analytics – Lido



It's not just about token treasury management best practices, it's also about the lack of professional treasury managers. The entrance of finance bros real financial managers for DAOs presents a [big market opportunity](#), and would help protocols diversify intelligently to ensure they are well-capitalized under all sorts of market environments. Unfortunately, you won't like the first recommendation most treasury managers would make today: start selling. A Q1 blow off top doesn't do a DAO any good if the asset nukes 90% mere months later.

(Required Reading: [A Crisis in Protocol Treasury Management](#), [A Mental Model for Treasuries](#))

6. DAO Investor Relations

I kicked off last chapter writing about how wild it was that *anyone* could create something that looked like ETH's Q3 "10-Q". Investor relations are a critical part of healthy financial markets. In crypto, the importance of high quality information is dialed up to 11, since *community relations* impacts how a DAO communicates with investors, liquidity partners, technical counterparties, core contributors, users, and other net promoters. Strong, transparent financial disclosures are the backbone of good corporate governance, but they're constrained by quarterly accounting cycles, limiting the flow of information to only a few times a year.



Blockchains and DAOs offer a near infinite improvement to quarterly reporting, as information is open to inspection at all times and processing speed is limited only by block propagation times. The open and permissionless nature of blockchains has led to a monumental shift that redefines the relationship between protocols and their investors. In this world, financial data is transparent, widely available, and accessible at all times. Protocol stakeholders are capable of tracking the financial health of the assets they hold in real-time, and information curators (like Messari) can curate updates over any arbitrary time scale via a decentralized community of developers, researchers, and data scientists.

[Token Terminal](#) (fundamental data), [The Graph](#) (on-chain data), [Nansen](#) (funds flows), [Dune Analytics](#) (aggregated metrics), [DeFiLlama](#) (TVL), and [Messari](#) (market data and off-chain events) are now essential tools that help users gain a complete understanding of protocol level performance. In the hands of a globally decentralized analyst community, the combination of these data sources provides remarkable results. Take Compound for instance.

MESSARI Compound Markets - Macro Overview

Compound Quarterly Metrics	Q2'20	Q3'20	Q4'20	Q1'21	Q2'21	Q3'21
Key Performance Indicators						
Outstanding Loans	\$359.0	\$1,057.3	\$1,754.0	\$5,490.5	\$3,546.1	\$5,565.9
% Growth		194.5%	65.9%	213.0%	(35.4%)	57.0%
Outstanding Deposits	\$981.6	\$1,849.9	\$2,873.9	\$12,018.1	\$9,590.1	\$14,195.2
% Growth		88.5%	55.3%	318.2%	(20.2%)	48.0%
Quarterly Originations	\$1,578.8	\$7,487.5	\$4,906.9	\$18,283.1	\$24,864.3	\$16,796.6
% Growth		374.3%	(34.5%)	272.6%	36.0%	(32.4%)
Quarterly Deposits	\$3,288.4	\$11,631.3	\$13,716.3	\$60,462.6	\$70,197.0	\$38,363.5
% Growth		253.7%	17.9%	340.8%	16.1%	(45.3%)
Liquidations	\$3.1	\$27.8	\$108.2	\$160.3	\$332.9	\$26.7
% Growth		797.6%	289.2%	48.2%	107.7%	(92.0%)
Aggregate Utilization	36.6%	57.2%	61.0%	45.7%	37.0%	39.2%
Financials						
Total Interest Income	\$2.4	\$12.4	\$20.6	\$88.0	\$96.3	\$77.6
Interest Expense (Interest to Depositors)	(\$2.1)	(\$11.2)	(\$18.7)	(\$77.6)	(\$85.4)	(\$68.6)
Net Interest Income (Reserve Factor)	\$0.4	\$1.2	\$1.9	\$10.3	\$10.9	\$9.0
% Growth		224.4%	50.0%	458.2%	5.3%	(17.2%)
Grants Paid	\$0.0	\$0.0	\$0.0	\$0.0	(\$0.6)	(\$0.1)
Net Income	\$0.4	\$1.2	\$1.9	\$10.3	\$10.3	\$8.9
% Growth		224.4%	50.0%	458.2%	(0.8%)	(13.4%)
% Margin	15.7%	9.9%	9.0%	11.8%	10.7%	11.5%
Token Incentives Paid	(\$8.7)	(\$36.8)	(\$22.4)	(\$65.4)	(\$90.5)	(\$75.8)
Adjusted Net Income	(\$8.3)	(\$35.5)	(\$20.5)	(\$55.0)	(\$80.2)	(\$67.0)
% Growth		325.6%	(42.3%)	168.3%	45.8%	(16.5%)
% Margin		NA	NA	NA	NA	NA

Data as of: Sep. 30, 2021

Source: Messari, Dune Analytics, Token Terminal

Our [quarterly report](#) provides a glimpse into the future of financial reporting. A single analyst and data scientist were able to team up to produce a summary of COMP's protocol-level lending and borrowing activity over the previous quarter (both at the macro and micro level), as well as off-chain events pertaining to community governance and the project's technical roadmap. This sort of reporting might continue to follow a familiar quarterly, monthly, or weekly cadence, but the data is real time and available for anyone to explore and combine.

While there is still much work to be done, the building blocks needed to establish the foundation of a new and improved financial reporting system are finally here. If executed well, crypto financial statements will

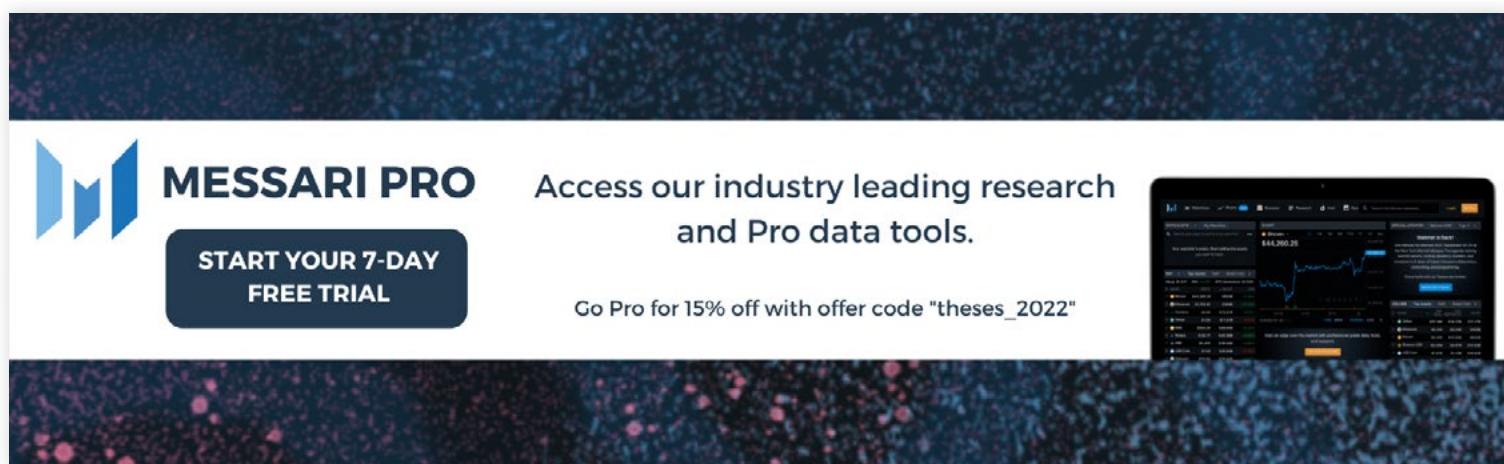


look much different from their legacy counterparts. Instead of impatiently waiting for quarterly earnings reports, protocol statements will be dynamic documents powered by live feeds of data streaming directly from the blockchain. All the pieces are ready to be assembled, now it's time to build.

7. Messari: Tying it All Together

What happens when you bring together learn and earn onboarding incentives (Marketing), a vibrant contributor marketplace (HR), improved treasury management and delegation tools (Finance & Ops), and project reporting / community relations (Management)? You've got the full stack of solutions needed to build replacements to existing governance constructs in politics, corporations, and the social fabric of society itself.

I'm so ecstatic to share our vision for Messari in 2022: we're building a [redacted].



The banner features the Messari logo on the left, followed by the text 'MESSARI PRO' in a bold, sans-serif font. Below this is a dark blue button with white text that reads 'START YOUR 7-DAY FREE TRIAL'. To the right of the logo and button, the text 'Access our industry leading research and Pro data tools.' is displayed in a smaller font. Below this text is a promotional code: 'Go Pro for 15% off with offer code "theses_2022"'. On the far right of the banner is a screenshot of the Messari Pro dashboard, which shows various data visualizations, including a line chart and several tables of data.

8. Legal Framework for DAOs

There are generally three things the government does to dissuade you from doing something it doesn't want you to do: tax you, fine you (or expose you to huge personal liability), or cut off your banking services. One of the things that is going to be a real bitch to figure out is how DAOs actually work in the real world from a tax, contract law, and compliance standpoint.

On paper, DAOs are actually pretty good at eliminating the "banking services" concern, given the entity itself is a shared bank account. They're not bad at addressing the personal liability concern either...if you're cool working anonymously and staying off the grid and you're confident that the rest of your compatriots in the DAO will do the same and feel comfortable taking on the group's liability risks if anything goes wrong. But they are really bad if you think you can join as a member, report your taxes from the DAO, and somehow not tip off the government that you're working with/for an unincorporated partnership.

Rolling the dice a bit, aren't you?

For most normal people, fixing the contributor liability issues, and bringing DAOs and their communities into global and local tax, banking, and employment compliance is going to be important. a16z has some [good proposals](#) for how to create legal DAO entities as unincorporated non-profit associations that may have



flexible, siloed sub-structures (LexNode echoed [some of the same ideas](#)), and Wyoming took the [national lead on this already](#) with its recognition of DAOs as a type of LLC. (Fun fact! Wyoming was the first state to recognize the *actual* LLC! In 1977. It took 11 years for the IRS to recognize the status as well.) This is also going to be a requirement for most DAO to DAO or DAO to business contract work as well.

Given how aggressive this administration has been so far towards crypto, I'd expect them to take a similar hard-line approach towards unincorporated DAOs as well. So registering in the US won't just be about meeting reporting requirements, paying individual taxes, and filing disclosures, but opening up core token-holding individual developers to liability in the event the authorities rule that these are general partnerships that issued unregistered securities. I don't blame teams for moving outside of the US.

(Required Reading: [a16z Framework](#), [The LAO](#))

9. The New Capital Allocators

I spent a bit of time talking about creator DAOs and social clubs in the section on NFTs, so I'll gloss over them here, and instead spend the last two sections of this report focused on two particularly transformative types of DAOs: Venture DAOs, and Curation DAOs.

On Venture DAOs, the only constraint on the growth will be legal and regulatory in nature. The original "this token is definitely a security" memo was "[The DAO](#)" itself. The demand in that original community investment vehicle proved how much demand there was (even then) for community investment vehicles accessible beyond the gated community of accredited investor land. Since then, there have been efforts to iterate on the Venture DAO model, and make it, well, legal. Metacartel socialized the token investment process and offered a vehicle that paved the way for fluid GP incentives (more work = more rewards). The group can invest in anything that might be tokenized: cryptos, companies, NFTs, other DAOs, virtual real estate licenses, you name it. It's a sort of flexibility in speculation that simply doesn't exist in the "real world" and probably cannot exist in the US without upgrades to our century old securities laws. If you look at how insular the crypto community is, it's almost certainly the future, too. Founders invest in other founders for strategic reasons: goodwill and aligned interests on partnerships, keep up on emerging trends, stay top of mind for *other* emerging projects, etc.

Today VCs are [investing in DAOs](#). Or [DAOs of DAOs](#). Or registering as [Investment Advisors](#) in order to remove the SEC shackles that prevent VCs from going full crypto. The late stage investors are [coming to Series A](#). The early stage investors are moving to [permanent capital vehicles](#). It's almost like the smart money knows that the capital markets are dynamic, and evolving rapidly. Venture DAOs are already hot, and barring a global regulatory setback, I'd bet that one of the most active and largest AUM VCs is a DAO by 2025. We've started to see DAO M&A pick up steam too. The next frontier would be the acquisition of a Web2 company to a Web3 company.

(Required Reading: [The Future of Venture Capital](#), [Venture DAOs: So Hot Right Now](#))



10. The New Information Curators

"The internet built Wikipedia, with no economic incentive. Don't underestimate what the internet can build as DAOs."

-[Jesse Walden](#), Variant

If you've been following me and Messari for a while, you know I'm bullish on token-powered information curation. The v1 token-curated registry primitive had some flaws, but in general, curation markets could replace centralized, ad-driven algorithms, improve credentialing and social signaling, reduce low-value redundant work, and crowd-fund high-value unique work in information services.

Let's start with the most important premise: curation markets can create incentives to crowdsource quality for a mission-aligned community. "Quality is very subjective!" you say, and that is true - people seem to really enjoy the dopamine (or cortisol?) hits they get from their current media consumption habits, which is why we have these sugary, low-nutrition sources of information in the first place. But there's three things web3 does a little differently that alter this.

1. It creates incentives for portable, open user-generated data. Breaking the Web 2.0 companies' data silos will open up a universe of possibilities.
2. It allows you to reflect on what you want to curate at any given time: "hey facebook, make me happy, make me nostalgic, inspire me, inform me, show me the conspiracy theories and all of the facts of this case."
3. DAOs will allow you to align with a tribe or an individual signal booster and build a curated information market around that entity.

That opens up the possibilities for alternatives to Google Search that looks less like page rank, and more like a custom feed. Or to toggle information filters based on your mood. Or get paid to be a bullshit-caller-outer in a post-truth media establishment. Substack has already monetized the intellectual dark web's long-form content. What's next?

Some of the projects in content creation that I'm excited about are PubDAO, which aims to build a [decentralized Associated Press](#). (You don't need 100 versions of the same basic news story!) There's [Messari's Hub](#) and [Analyst DAO](#) for decentralized token research. And [BanklessDAO](#) is doing some pioneering work crowdsourcing various channels and verticalizing crypto coverage across its community (Art, DeFi, DAOs). As we touched on earlier, we're starting to see more experiments in how [long-form content is funded](#) via Mirror.

When it comes to quantifiable data sources, the prospects are equally exciting. The Graph turned a token curated model into a multibillion dollar decentralized blockchain data indexing platform. For token metrics, there's [MetricsDAO](#) by Flipside, and I'm sure we'll see [DuneDAO](#) soon. Projects like IndexCoop have made it possible for curators and information providers to leverage their curative strengths and communities to propose low lift discretionary indices that power [new synthetic instruments](#). These are things that simply aren't possible in regulated financial markets, or if they are, take years and millions of dollars to effectively produce. Outside of crypto, Balaji has been thinking about content creation bounties beyond crypto as well, proposing a competition to create a [crowdsourced inflation dashboard](#).

I wrote in 2017 when we unveiled Messari to the world that the "Bloomberg of Crypto" wouldn't be a company, [but a network](#). As an industry, we've finally got the tools to make that a reality.



BONUS: Whatever I Want

1. Why You Must Write	162
2. No Sacred Cows	163
3. My Information Diet	163
4. Tips & Productivity Tricks	163
5. Life Advice	164



Bonus Section: Five Parting Thoughts

This is where I'm burying the real alpha and controversial takes. Cold war with China and the imminent balkanization of the US and the West. The future of our crumbling military and cancel culture. My thoughts on all of the sacred cow issues. My 2024 run for office. The necessary & utter destruction of the mainstream media. And my most controversial take, which is that you should work relentlessly hard, shut up and build, and earn your stripes in the world.

Just kidding. I didn't write 180 pages to get canceled at the very end. Maybe over beers.

I do have some final thoughts for anyone interested in how the horrible monkey inside my mind works and processes the world - inside and outside of crypto.

1. Why You Must Write.

I've been asked how I can write this annual report and still run a company. As I said in the introduction, this is a good marketing asset for attracting [enterprise customers](#), partners, and [recruits](#); it should drive good conversion to our Pro product ([ahem](#)); and it doubles as my annual crypto deep dive and product ideation session. "What did I miss, and where are we heading?"

I'd flip the question back to you: how can you survive the remote-first, globally-distributed, hyper-growth, crypto chaos without writing well? Reading helps me identify blind spots, but it's writing that helps me focus and streamline my thoughts.

Whether it's code or prose, you must get better at writing.

Good code elegantly communicates your ideas to computers, and spits out products that delight users. Good prose elegantly communicates your ideas to other humans, incepting new ideas into their heads (through memes), and if you're doing it right, converting missionaries to your cause. Nic Carter had the [best piece I read this year, On Writing](#), which probably not coincidentally happens to be the [title of the Stephen King book](#) I recommend to all new professional writers. Nic is crypto's best writer. The Theses is my annual entry into the competition for second place. I'll steal his "On Writing" closing graf here:

"For me, the struggle of writing is chiefly one of vanity versus utility. Being concise is hard. It requires painfully shedding text that you've sweated and labored over. Being sufficiently humble that you are willing to convey ideas into the heads of your readers at the expense of demonstrating your skill with words — that is the challenge. But as with all asceticism, there's a sublime joy in restraint. The best writers must learn it. Writing is for the reader, after all."

I hope these pages have been helpful, entertaining, and only partially self-indulgent.



2. No Sacred Cows.

When it comes to learning, there are no sacred cows. Same goes for crypto. The very best quote of the year came from a young hustler analyst I know who disavowed bitcoin late last year because he was optimizing for making money, “not winning a purity contest.” That analyst was very, very right in the past year, and it paid off big.

I’m not going to set myself up for cancellation by going issue by issue, but when it comes to writers, I happen to think [Bari Weiss](#) and [Glenn Greenwald](#) are two of the last remaining good journalists out there. (Thank god for substack.) In general, I try to read whatever is on their “banned books” lists, and then find the most cogent counterpoint. Sometimes the banned book is a crazy conspiracy theory. Sometimes, it’s alpha (ahem, early COVID coverage). But there are no sacred cows if you’re in the process of learning about a subject. You’ve gotta be open-minded, but stick to [your guns](#) once you’ve got the information you need.

3. My Information Diet

Here’s a stream-of-consciousness brain dump of the most important things I have read and internalized and shared in the past year:

[Build stuff](#)....If you’re overthinking, write. [If you’re underthinking, read](#)....Your boss is [tired of being your manager](#). (How you can manage up)...“*Don’t follow your passion. Seriously. Don’t follow your passion. Your passion is likely more dumb and useless than anything else. Your passion should be your hobby, not your work. Do it in your spare time. Instead, at work, seek to contribute. Find the hottest, most vibrant part of the economy you can and figure out how you can contribute best and most. Make yourself of value to the people around you, to your customers and coworkers, and try to increase that value every day*”...Learn [the Cadence](#) of a SaaS startup, lessons from [vertical software investing](#), and [how to work backwards](#)...Peruse the crypto canon and learn to love [Lord Vitalik](#) (web3), [King Arthur](#) (markets), and [Nic Carter](#) (bitcoin). They’re the GOAT writers of crypto. Bankless is king of the [crypto pods](#). Turn on notifications for [Balaji](#) and [Punk6529](#). That’s it.

4. Tips & Productivity Tricks

The most important productivity hack I recommend is maintaining zero direct reports who aren’t insanely organized, communicative, and capable of managing up. I’m lucky to have found good, hard-working people who share my vision for the future, and help bring it into sharper focus each day, while allowing for the fact that there are some things I will simply never get better at, regardless of my best efforts. That is to say, thank you to the Messari team (especially, [Ben](#), [Diran](#), [Emily](#), [Eric](#), [Florent](#), and [Maartje](#)) for crushing it in the few weeks that I was essentially absent while writing this report.

Here are a few other habits I (try to) live by, for better and for worse.

Communications: I don’t have Superhuman, but I live by Gmail’s snooze button and multiple inbox set up, which serves a similar purpose. I also use pinned twitter lists, keep open DMs, maniacally filter, unsubscribe, report, and block unsolicited or negative messages on twitter and email. I’ve significantly limited my time on Telegram and Discord this year, and I’m happier for it. Slack for the team, email for business, twitter and signal for play. That’s it. (*Update: I am starting to come back to discord now as it aligns with our new product (launching next week)*).

Meetings: I try to limit internal meetings to 20% of my time per week, which is not bad when you add up weekly leadership team and recruiting syncs, bi-weekly all-hands, and 1:1’s with direct



reports, monthly functional team meetings across eight different groups, quarterly skip-level meetings, and other miscellaneous strategy, product, and HR syncs that arise in the normal course of scaling. Crypto has scaled a lot this year. I don't have any idea what I'm doing...I've never managed a company this size, but that's sort of the point. My team remains small. I learned a lot from Elad Gil's High Growth Handbook. (Thanks, Elad!)

Transparency: My personal calendar is public for the whole team to see, so everyone can generally see where I'm spending time, and when I'm available. They also know I am generally working 8-6 with rigidity on either side of that (yay, kids!), plus nights and weekends here and there (I'm no longer in my 20s). I'm always on the lookout for tips on running more productive meetings, especially since the nature of meetings is changing as we continue to scale in a remote first world. Remote-first engagement is my #1 priority for 2022 as we're all learning how to balance the new post-COVID normal. Again, send me ideas!

Mind, Body, Soul: I have had Headspace installed on my home screen for five years and have used it ~11 times. Please clap. I have also learned that I get a really good night's sleep when I read books before bed and turn off my phone without ending my day doomscrolling twitter. I have even done this successfully three or four times, and I have completed the first chapter or two of dozens of books. I know - I am a god among men. I also hit things several times a week if you want to challenge me. No, seriously, you can challenge me here. (Thanks, Fightcamp.)

5. Life Advice

This is probably obvious, but I don't know what I'm doing and neither do you. But if you are fortunate enough to do so: get married, have kids, move to the burbs. (Eventually.) You will not give a f*ck about 5% swings in the market when your day ends with a five year old laughing about one of his farts, a three year old telling you a story via a three minute run on sentence and a half naked one year old tackling you at the knees during your final zoom call of the day.

If you're reading this, you are (hopefully) a [time billionaire](#). That does not change the fact that you are at [The Tail End](#) of many of your relationships (I read this post once per year), and that it is always Day 1 / [everything is in your control](#).

Now off to play with my kids. I've earned it, fam. Happy holidays!

-TBI



About Messari

Founded in 2018, Messari is crypto's leading market intelligence platform and trusted portal providing the most reliable data and research products and services for professionals looking to make the most informed crypto decisions.

Driven to bring transparency and smarter qualitative and quantitative analytics to the industry, Messari provides a global research database alongside a comprehensive suite of leading indicators, tools, and screening capacities geared towards all ecosystem participants and institutions alike. To learn more, visit: messari.io

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