



**Ether (ETH) Bearish Thesis:  
The “Flippening” of Market Irrationality**

*Short Initiated: May 2018*

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# **I. Overview**

Over the last year, crypto-asset markets have run wild on the thesis that value accrues to the “infrastructure layer of blockchains”. We now see nearly every project in the space define themselves as the blockchain infrastructure for XYZ industry, and the valuations of nearly all the tokens native to these networks have skyrocketed as a result.

Entrepreneurs are flocking to build decentralized communities, blockchains, and tokens where they are not only unnecessary but, in some cases, detrimental to the system they are meant to underpin. Uncertainty around regulation and value capture is orders of magnitude higher in the crypto-asset space than with traditional equity investments, yet, almost absurdly, crypto-asset valuations have ascended higher in comparison. Ethereum and its native asset, Ether (ETH), sit at the center of this mania.

The recent decline in ETH’s price suggests that the speculation that drove it to new heights over the past year is exhausting. Just as ETH benefited from irrational exuberance, it will inevitably suffer further as the market sobers up.

We believe that ETH’s current price is *still* significantly overvalued; *still* significantly decoupled from the Ethereum network’s current and near-term technological state. Our research has led us to believe that the market and technology is still far too immature to justify current valuations. This nascent asset class has taken off due to speculative narratives, and we believe that the current marketplace is not sophisticated enough to properly evaluate risks or general economic concerns.

On the surface, some of the Ethereum ecosystem’s key performance indicators (KPIs) have been promising. As of July 2018, ETH’s market cap was roughly \$45 billion. Ethereum currently supports thousands of ERC20<sup>1</sup> tokens (35 of which are worth greater than \$100 million) and over 1,500 decentralized application (DApp) projects. The Ethereum network currently processes roughly 750k transactions per day.

The network is seeing some genuine demand, but we believe that this demand is far from sufficient to justify ETH’s price. When there is an expectation that a crypto-asset can achieve/exceed a trillion-dollar market cap, the asset must become some reserve store of value (SoV). We believe ETH lacks the crucial characteristics required for a dominant SoV, and we see a low probability of ETH taking the reign from the current crypto-asset leader, BTC – let alone from incumbent globally dominant assets like the USD and Gold.

Whatever the probability, ETH’s chance at becoming a reserve SoV in the future will depend heavily on it being tremendously successful at one of its main use cases:

- A. A decentralized application platform
- B. A capital raising platform

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<sup>1</sup> A technical standard for implementing tokens on the Ethereum blockchain, commonly distributed via public crowdsale (ICO).

Upon digging deeper, we currently see Ethereum struggling at both:

- A. The platform has severe issues on technical and decentralization<sup>2</sup> fronts (both architecturally and politically) that will persist both over the short and long term. These issues question its value proposition over cheaper, more efficient, less risky application platforms.
- B. The commoditization of capital raising is already eating away at the main source of genuine ETH demand. Additionally, (incoming) regulation surrounding ICOs will severely curtail this demand.

While Ethereum's current "brand name" edge may continue for some time, it has yet to solidify any functional competitive advantages.

Understanding the imminence of key catalysts, Tetras began building an ETH short position in May 2018. Although we do believe a naked short was justified, the primary motivation for this short position was to hedge a core long position in BTC. As mentioned in all our updates since the start of the year, we believe the next, sustained crypto bull market will be led by BTC. Shorting ETH is an ideal strategy for hedging out overall crypto market risk because:

- ETH has minimal "breaking news risk" that can move the price unexpectedly
- ETH is the asset and Ethereum is the ecosystem we understand best behind Bitcoin
- ETH has a mature enough market to facilitate reasonable borrow terms

We believe the coming months will be extremely telling for Ethereum's future. Network strain (from DApp usage), competition (from alternative DApp platforms), and regulation (towards ICOs) will test the speculative hype and price of ETH.

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<sup>2</sup> In this paper, we will leverage Vitalik Buterin's definitions of "decentralization":

**Architectural (de)centralization:** How many physical computers is a system made up of? How many of those computers can it tolerate breaking down at any single time?

**Political (de)centralization:** How many individuals or organizations ultimately control the computers that the system is made up of?

## II. Ethereum / ICO Mania

In late 2013, in response to the limited programmability of Bitcoin, Vitalik Buterin proposed a new blockchain project, Ethereum, centered around a Turing-Complete programming language and self-enclosed virtual machine environment. This supposedly enabled a “multi-purpose blockchain and world computer”, wherein you could build robust applications directly on a blockchain. Per the platform’s intended decentralized nature, these applications would be accessible to any of the network’s users “without any possibility of downtime, censorship, fraud, or third-party interference”.



Source: [web.archive.org/web/20161126073707/https://www.ethereum.org/](http://web.archive.org/web/20161126073707/https://www.ethereum.org/)

Ethereum’s vision of a decentralized platform for “unstoppable applications” resonated with many developers that sought to build decentralized applications but found Bitcoin’s limited programmability insufficient for their work.

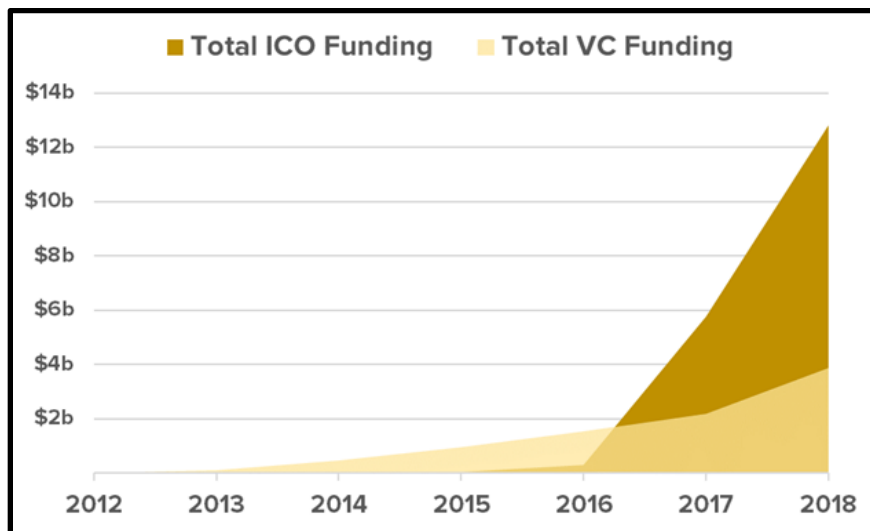
### The Mania Begins

In 2014, the Ethereum Foundation raised roughly 31,500 BTC (about \$18 million at the time) in a public crowdsale, setting the record for the biggest one-time crowdfunding initiative on the Internet. Participating in the ETH crowdsale turned out to be one of the largest short-term wealth-generating events in history.

Ethereum’s successful public crowdsale, ETH’s price performance, the ability for anyone to easily create their own token on top of Ethereum, and the general fear of missing out on another crypto-asset price explosion ushered in an enormous wave of ICOs. Enthusiasm around the decentralized application platform quickly turned into mania over capital raising schemes.

Using the ETH crowdsale as a template, teams set up Swiss non-profit organizations and launched public crowdsales for new tokens – in most cases lacking functional networks and qualified developers.

VC-tailored “SAFT” deals (Simple Agreement for Future Tokens) rapidly became the buzz of the tech world. Prominent venture capitalists proselytized an imminent future saturated with decentralized applications and tokens. Projects and teams only tangentially related to the crypto-asset space (and some not at all related) joined the race to raise money through ICOs.



Source: [coindesk.com/ico-tracker](https://coindesk.com/ico-tracker), [coindesk.com/bitcoin-venture-capital](https://coindesk.com/bitcoin-venture-capital)

The inflection point of ICO funding outpacing blockchain venture investments coincides with Ethereum’s main-net launch. Before Ethereum, there was less than \$100 million of total equity and token investments. \$1 million VC rounds were considered large and newsworthy events for the industry.

Funding ERC20 contracts with ETH has been the primary way to participate in token crowdsales. ICOs, therefore, are a major component of why ETH’s demand and price rose over the past year.

Today (four years after the ETH crowdsale), ETH has returned roughly 1,700x while BTC has returned 10x over the same period. The Ethereum-ICO mania grows to this day, albeit with some signs of slowing down – and we now believe the stage has been set for a substantial bubble deflation.

### **III. Can Ethereum Grow into its Valuation?**

As we discuss below, we believe that the only way for Ethereum to grow into and justify its current speculative valuation is if it can become a reserve store of value. This is discussed in greater detail in the SoV section, but we view Ethereum's use cases (below), simply as means to this end. The only way Ethereum can become a reserve SoV is if it is successful (and dominant) in one of its two primary applications:

**A. A decentralized application platform**

**B. A capital raising platform**

Even with wild success in either category, we remain skeptical that ETH could become a reserve SoV.

If Ethereum's ability to satisfy these value propositions diminishes over time or fails to even manifest itself in the first place, speculative demand (or current holders of ETH) will naturally grow impatient and exit, dragging ETH's price down.

#### **A. Ethereum as a Decentralized Application Platform**

Currently, the Ethereum network has a number of live DApps running on top of it – most of which are token exchanges and games. It is not clear to us that the majority of these live applications actually benefit from leveraging a decentralized platform like Ethereum. Instead, we lean towards believing that most of the applications have simply capitalized on the excitement around Ethereum, which allowed them to raise capital at a higher valuation.

For the handful of applications that would (and do) benefit from decentralization, it is not even evident that Ethereum is the best platform. Depending on the project, there are more appropriate approaches to facilitate DApp development, deployment, and use – both on and off blockchain. The market has yet to ask these questions because of the dearth of real use.

Valuations are not only a function of current fundamentals but also of near-term expectations about these fundamentals. What does the future look like for Ethereum DApps? Even with its current minimal DApp usage, the Ethereum network is showing signs of severe resource strain. This means one of two things:

1. Ethereum must weaken its degree of architectural decentralization by way of block size increases (or other decentralization-weakening changes) which increase the operating costs and resources necessary to run its network nodes, ultimately reducing their number. As such, Ethereum loses its unique platform characteristics relative to cheaper, more efficient, less



risky, more developed, better capitalized application platforms. Losing its decentralized status is a non-starter for applications that actually need a decentralized architecture.

or

2. Ethereum will accept high and/or unpredictable transactions fees that are paid upon every function call within an application. High and/or variable network fees would severely limit most DApp use and ultimately DApp growth.

The first approach, raising block size, does not necessarily guarantee that fees will be “low”. Fees will be lower with an increased block size, *ceteris paribus*, but fees are still relative to other alternatives.

Prior to Layer 2 or other scaling solutions (i.e. Sharding) rolling out, Ethereum cannot support substantial transactional volume without a subsequent spike in fees or plummet in node count (architectural decentralization).

Ethereum is currently stuck in a Catch-22. At the current valuation of \$45 billion, the market is pricing in at least a moderate amount of near-term genuine demand for Ethereum as a DApp platform. Simultaneously, however, Ethereum will not be in a place to support the kind of demand needed to justify its current valuation for the foreseeable future.

## i. Centralized vs. Decentralized: Tradeoffs Imply Only Niche DApp Demand

Creating decentralized applications comes with considerable tradeoffs.

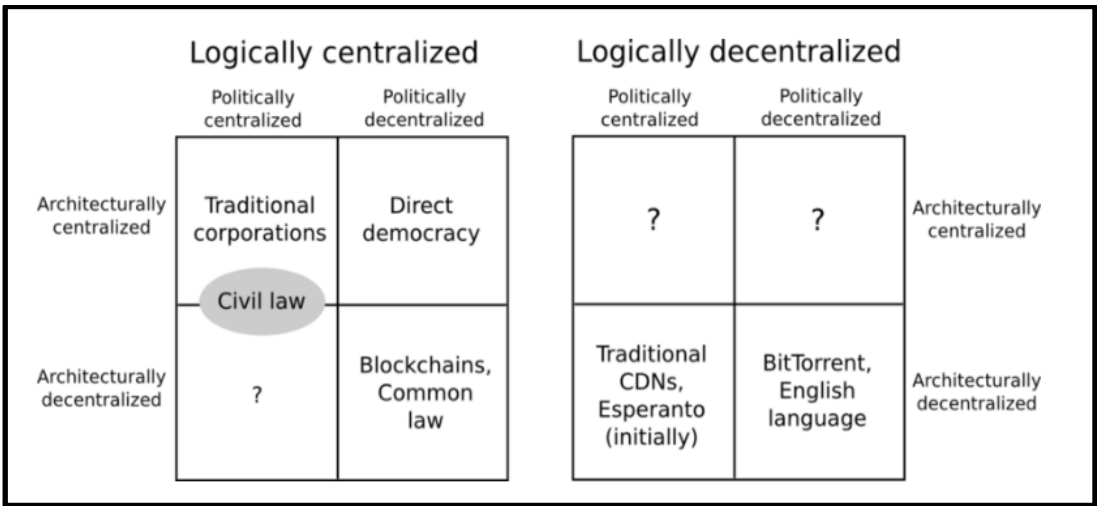
When evaluating applications (or DApps), it is critical to discern the motivations behind the tradeoffs made for decentralization. Blockchains are innately security software – cryptographic data structures to prevent things. In contrast, normal software focuses on letting users do things. The Bitcoin blockchain’s innovation was in preventing the double spending problem in a decentralized, digital manner (by using a decentralized network and incentive mechanism) – and chose to limit its scripting language for increased security. If an application cannot identify exactly what a blockchain is helping it prevent, it should not leverage a blockchain.

The overwhelming majority of businesses on the web today are architecturally and politically centralized for **economic reasons**. There are tremendous efficiencies, performance benefits, economies of scale, and security benefits gained by operating in a centralized way, such that the purported benefits of decentralization (e.g., censorship resistance, immutability, self-custody / lower exit costs, etc.) are often outweighed. Given the steep *effective costs* of doing so, a project should only try to decentralize if it absolutely requires a benefit of decentralization. In other words, given economic and not technical reasons are the cause of the “centralization”, technical considerations alone cannot justify “decentralization”.

Most projects attempting to incorporate a blockchain are conflating the concept of architectural decentralization with only a single aspect of what a blockchain-based architecture entail. There is a

much larger architectural design space beyond blockchain that may include a more appropriate design for most project.

Blockchains, or at least Bitcoin, occupy a unique space among databases with **architectural and political decentralization** but **logical centralization**. This ensures that Bitcoin is simultaneously scarce and not controlled by any trusted party. The architecturally decentralized network that many independent full nodes support ultimately converges on a consistent and global transactional state (logical centralization).

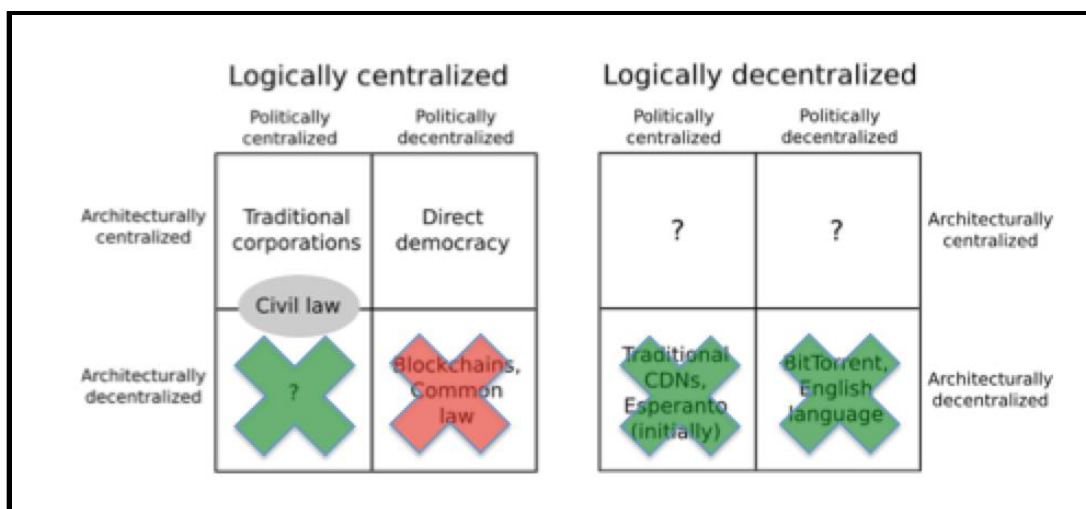


Source: Vitalik Buterin, [medium.com/@VitalikButerin/the-meaning-of-decentralization-a0c92b76a274](https://medium.com/@VitalikButerin/the-meaning-of-decentralization-a0c92b76a274)

A blockchain based application and token is useful if and only if the system needs both (1) decentralization (architecturally and political) and (2) digital scarcity (logical centralization). **Not either or.**

Many projects could simply benefit from, say, a dispersed array of servers (for resilience and other accompanying benefits) + TOR, and accomplish much of what has been marketed by blockchain promoters – without the bandwidth, storage, security, and database write costs of a blockchain. Silk Road is an example of a “decentralized” business that took this approach. Blockchain has a much narrower use case than has been advertised and commonly believed.

From our perspective, most DApps have chosen to use Ethereum because of Ethereum’s logical centralization that enables the creation of new ERC20 tokens – which allowed them to raise quick and easy money through their own ICO. In reality, most of these projects have no use for a token whatsoever and therefore have no need for logical centralization. These DApp tokens have largely been bolted on either mistakenly or for opportunistic non-dilutive fundraising. Later, we contrast AWS and Filecoin to show that tokens are generally uneconomical (tokens are money, not equity – and thus will accrue value in an entirely different manner). If you grant that most DApps do not need a token, they belong in one of the three green X’s below and not the red.



The data/cloud storage vertical is flush with projects using varying architectures and highlights the tradeoffs between centralized and decentralized architecture well. Filecoin raised \$256 million at a nearly \$3 billion valuation – even with massive value capture and regulatory uncertainties. Projects like Filecoin, Sia, and Storj (all determined to use a blockchain) will likely continue to have a hard time achieving widespread adoption. Why? To do so, they need to compete with Amazon S3 and Microsoft Azure, both of which have provided reliable, secure, and cost-effective services. Centralized businesses can have high encryption guarantees, transparent recourse, customer support teams, and Service Level Agreements – which seem to be the real priorities for customers. For most projects that utilize data storage, popular centralized services are sufficient.

This does not mean that there is not a market for decentralized data storage. But for any decentralized business to win market share, it needs to either (1) carve out a unique niche where the benefit of decentralization (such as censorship resistance) is valued enough to justify the inefficiency and added costs, or (2) provide a “10x better experience”. The latter seems extremely unlikely for blockchain technology given the lack of control over counterparties and higher costs. The former could hypothetically propel a protocol’s success, but we do not see any evidence that the “censorship resistance” niche is large enough – even ignoring that tokens are currencies and not equity (which we explore in depth later) – to justify the staggering valuations in the blockchain space (i.e. Filecoin raising \$257 million at a \$3 billion valuation).

As more decentralized applications launch, these costly tradeoffs will become more apparent.

## ii. Ethereum Network Strain Means Centralization and/or Stunting Critical DApp/Platform Growth

A blockchain's architectural decentralization stems from the ease of running a full node<sup>3</sup>. Part of the value proposition of a blockchain is that each individual can act as a check on one another against prohibited<sup>4</sup> network activity. This gives rise to a secure system where no third-party authority is needed to enforce trust or provide that security. More independent nodes verifying means there is less chance of prohibited network activity. If operating costs for nodes increase, the node count will decrease – effectively increasing centralization and the chance for malicious network activity.

Even though Ethereum has minimal use today, the network is already showing signs of severe resource strain. To compensate in the near-term, Ethereum's block size can be raised over and over again. But raising block size translates into greater full node operating costs (thus reducing their number). In effect, Ethereum's path seems to be heading quickly away from architectural decentralization into becoming a centralized service or, at best, some sort of "in-between".

This resource strain has also caused transaction fees to rise which challenges DApp use, growth, and their *raison d'être*. There is no definitive solution to this resource strain issue, and proposed solutions may amplify technical and political centralization risks.

### **Ethereum "Block Size"**

Ethereum, by featuring a Turing-Complete programming language and a self-enclosed virtual machine, effectively deprioritized architectural decentralization by allowing for arbitrary contract complexity and unilateral miner control over the gas limit (block size). As the network is increasingly tapped to write, execute, and store complex code, more storage space and bandwidth is needed by full nodes to compensate. Something must be done *now* to preserve Ethereum's decentralized status and ensure DApp growth.

Ethereum *can* increase its block size. But, as mentioned, an increase in a blockchain's block size allows for increased network throughput but increases full node operating costs. Each block size increase lowers the network's degree of decentralization. If no other scaling strategy is used, both (1) larger and faster-growing blocks and (2) increasing bandwidth costs will make it more difficult for large numbers of nodes to stay in sync. The kind of traction justifying Ethereum's current speculative valuation would require the network to adopt a high degree of centralization.

To accommodate 10 modestly successful live DApps with 50k daily active users (DAUs) each, Ethereum would need over a 4x block size increase based on our gas estimates.

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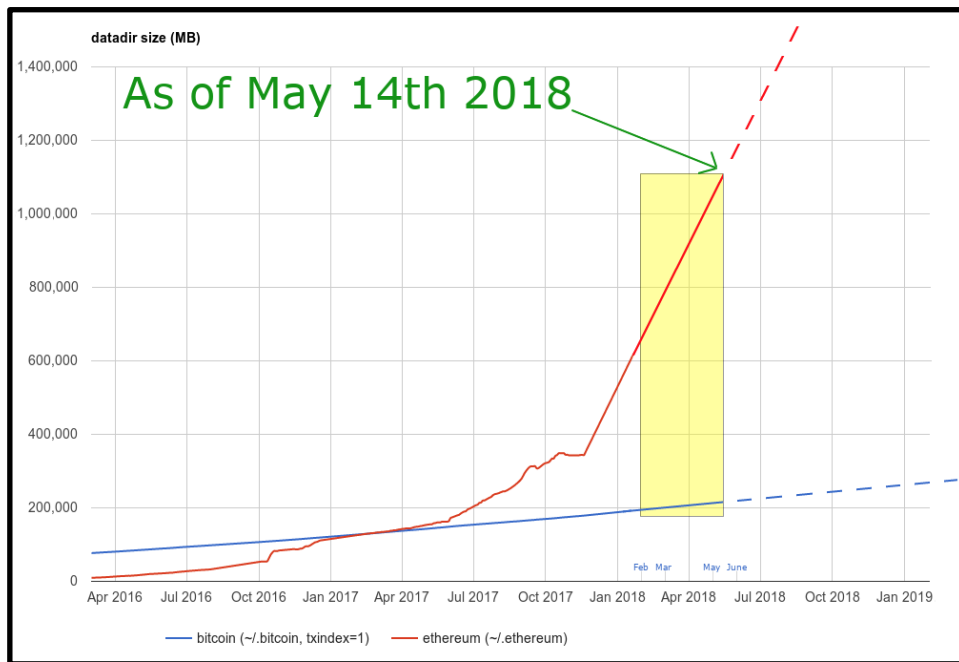
<sup>3</sup> Full nodes hold a copy of the entire blockchain and actively validate, sync, etc. incoming network transactions.

<sup>4</sup> Not wanted by the users of the network, each running the same core software to abide by the same rule set, like the inability for one to freely manipulate their holdings or spend the same money simultaneously.

Current DAUs	5000
Volume	10000
<b>Volume per user</b>	<b>2</b>
Live Apps	10
DAUs per live app	50000
New DAUs	500000
New Volume	1000000
Total gas used / day	200,000,000,000
Gas limit / day	46,080,000,000
<b>Multiple Increase necessary</b>	<b>4.34</b>

*Illustrative example of increasing Ethereum live DApps, users, and gas usage compared to current limits, assuming all activity is on layer 1.*

But even if Ethereum limits block size growth now, the size of the Ethereum blockchain is still projected to grow faster than Bitcoin's. Projecting historic data directory sizes (solid lines) of Ethereum and Bitcoin full nodes forward (dotted lines) illustrates the rapid divergence (as done by StopandDecrypt below).



Source: [hackernoon.com/the-ethereum-blockchain-size-has-exceeded-1tb-and-yes-its-an-issue-2b650b5f4f62](https://hackernoon.com/the-ethereum-blockchain-size-has-exceeded-1tb-and-yes-its-an-issue-2b650b5f4f62)

## Ethereum DApps

Forced architectural centralization has already started occurring in Ethereum. Many major DApps are relying on INFURA to process their transactions, instead of running nodes themselves. INFURA is a ConsenSys company that provides Ethereum scaling solutions by running dedicated full nodes. Instead of individuals and decentralized applications paying the cost themselves to run a full node, INFURA provides a “trusted” service for them to do so. As we described above, we believe that

independent full nodes are at the core of what makes a blockchain interesting and valuable. But now, “decentralized” applications on a “decentralized” application platform are relying on a centralized service to survive.

This is especially concerning because these DApps have only *hundreds* of daily active users and only *thousands* of transactions. **No DApp currently has more than 5,000 DAUs or 50,000 daily transactions, yet independent full nodes are already having trouble:**

#	Name	Category	Balance	Users 24h	Volume 24h	Volume 7d	Tx 24h	Tx 7d
1	INDEX	Other	44,966.85	3,186 -14.49%	7,017.22 -25.94%	55,358.47	19,198	156,819
2	ForkDelta	Other	29,444.91	1,413 -14.47%	672.99 -25.76%	9,457.57	4,796	42,927
3	CryptoKitties	Game	202.29	322 -7.47%	26.19 -15.47%	226.67	3,331	25,232
4	ETHEREC	Other	16.85	281 -6.33%	11.45 -66.46%	133.97	951	5,976
5	Ether Goo - Idle Game	Game	94.41	186 +116.28%	1.79 -11.14%	20.78	1,367	7,778
6	Ether Online: The ETHagon	Game	7.07	183 +22.82%	1.85 +13.10%	25.68	575	3,997
7	Etheremon	Game	166.70	178 -20.18%	6.50 -95.27%	246.85	2,526	8,930
8	The Token Store	Other	690.14	170 -11.92%	56.98 -4.34%	216.12	727	4,013
9	LocalEthereum	Other	101.91	165 -7.30%	90.34 -24.94%	1,258.33	360	3,488
10	Bancor	Other	0.00	121 -3.97%	0.00 -	1,466.90	258	3,512
TOTAL DAPPS: 598      24H TX: 50,753      24H USERS: 8,328      24H VOL: 8,334.13 ETH								

Source: [dappradar.com](http://dappradar.com), 6/17/2018

Ethereum growing into its current speculative valuation may require north of hundreds of thousands (if not millions) of DAUs and millions (if not billions) of transactions.

Ultimately, this strategy of using INFURA is not all that different from relying on AWS to process transactions (as we elaborate on further below), yet it comes with much steeper costs. Part of the reason why these DApps are using INFURA is indeed to lower their overhead, but this does not discount the potential moral hazard and centralization this creates. The architecturally decentralized application platform Ethereum sought to build seems to be slowly devolving into an obfuscated AWS with INFURA as the front end. We will later discuss how this could potentially be mitigated.

*Side note: INFURA is completely free right now – meaning ConsenSys is subsidizing all the costs, which may amount to >\$10 million / year. As costs rise, it is likely ConsenSys will ultimately be forced to charge users for the service, meaning, ETH fees now are actually artificially low, albeit not significantly. INFURA has publicly recognized that this is an issue. From day one, they never intended to be a single central gateway. To credit INFURA, they have been working both internally and with external parties to find ways to mitigate this network risk.*

## Ethereum Censorship Resistance

Ethereum’s supposed value proposition vs centralized platforms is its censorship resistance. However, if Ethereum continues trending towards more architectural centralization, there are no guarantees this protection will exist.

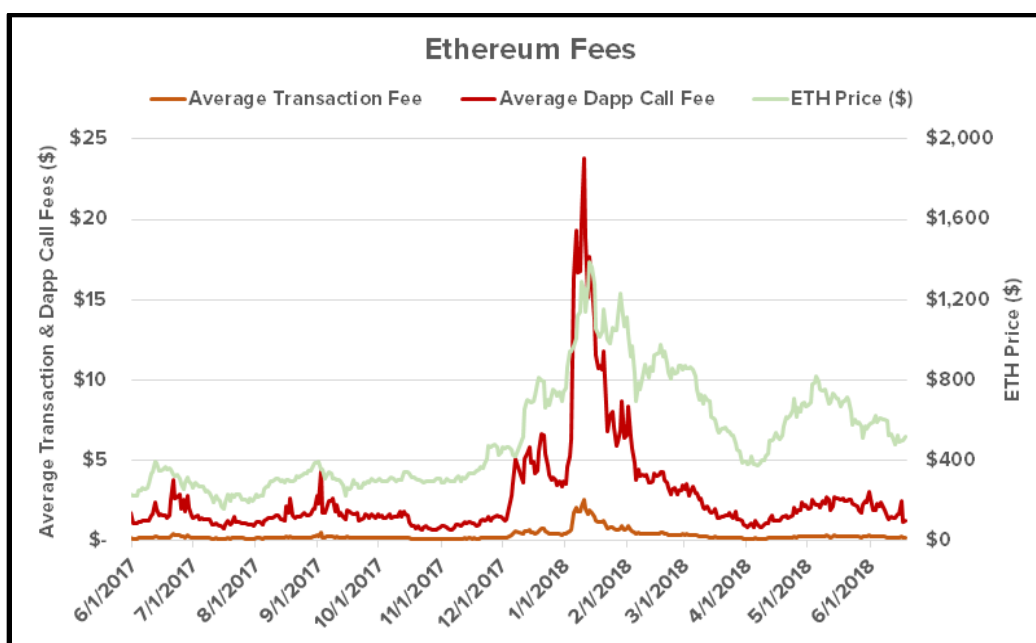
Augur, for example, is already defaulting to INFURA for validation of its network, and the Augur team has the unilateral ability to freeze token contracts. CryptoKitties, one of the most popular Ethereum DApps to date, has also leveraged INFURA for overhead and implemented a “kill-switch”. These applications have marketed their resilience vs a competitor on AWS (where governments could hypothetically subpoena and freeze). But if the application is just trading AWS for INFURA compute, it will still be trivial for a government to halt the application. Yes, there are still some architectural differences between AWS and INFURA, but they are rapidly converging where it counts.

Real censorship resistance needs a myriad of validators and core project members in different jurisdictions that embrace the technology. We have yet to see an Ethereum DApp that we would call fully censorship resistant. Many leading DApps have also been found to have backdoors in their code simply allowing teams to modify or pause the app entirely at will.

## **Ethereum Fees**

Ethereum’s architecture taxes a user per “state update<sup>5</sup>/contract call. This tax is a fixed “gas” amount (from a coded “fee schedule” per operation, that can change) that has a variable price of gas (paid in ETH to miners) regardless of the monetary value transacted.

An average DApp call is roughly 200k gas. With gas prices where they are now and have averaged historically, this costs roughly \$3. But during times of high network use, usage worthy of Ethereum’s current speculative valuations, each DApp call could cost north of \$20 – which is what occurred at the end of 2017.



Source: [etherscan.io/charts](https://etherscan.io/charts)

<sup>5</sup> Every time a program takes a “step”, e.g., executes a function, the program’s state is updated.

This is for a *simple application call* (e.g. something like birthing a Cryptokitty, naming a game character, or commenting on a social media post). An application call can be roughly **1 million times as expensive on Ethereum as compared to a centralized service like AWS**.

High fees will be palatable in the case users are buying (or doing) something unique. But fees need to be taken in context of the competition.

Some may point out that these fees are (or have been) less than Bitcoin's transaction fees. Bitcoin's competition is state controlled inflationary fiat currency – where almost no fees are too high to protect against hyperinflation. Whereas, if Ethereum devolves into a more centralized and trusted platform, it cannot claim to have these same benefits. And if that is the case, (as discussed above) most decentralized applications on top of Ethereum can leverage a much cheaper alternative platform – with or without the same benefits.

On one hand, high fees indicate demand for the Ethereum network, proving its use case. This defense is frequently used by Bitcoin proponents. However, this is different for Ethereum for two critical reasons:

1. High fees on Ethereum are not necessarily indicative of high value flows. Ethereum charges a fixed amount of gas per contract call, regardless of monetary value. On July 2nd, for example, an exchange contest led to one token taking 18% of gas because of users spamming the network with votes. As a result, ETH transaction fees as % of total value transacted has been much more volatile lately as more DApps launch.
2. As discussed above, we think that demand for block space on Ethereum will prove to be very elastic because most of the applications can and should use other platforms. Above a certain amount, fees will be prohibitively high for most applications. Just one instance of high fees on Ethereum could result in (1) a permanent attrition/loss of users of a DApp or (2) DApps choosing to leave Ethereum for an alternative platform. How long will Cryptokitties users be willing to pay \$3 to the network for each Cryptokitty birth, when they could do the same for nearly free if Cryptokitty developers used a slightly more centralized platform (like EOS)? It is tough to justify the appeal of an application when the fees are extremely high and the user experience contains much more friction than more centralized alternatives.

Bitcoin is not totally immune either. If Bitcoin also devolves into a more centralized platform that can hyperinflate the currency, its fees will also be too high. In other words, fees need to be evaluated relative to alternatives. If Ethereum cannot provide strong censorship resistance guarantees for applications, its fees will preclude all usage. Even if Ethereum does provide these advantages, there is always the threat that applications can migrate to other platforms that can provide similar guarantees with different tradeoffs.



## More Centralized Platforms Can Outcompete Ethereum

Ethereum is now stuck in a middle ground, where it cannot be as decentralized as Bitcoin and it cannot be as seamless and low cost as AWS (or even the other more centralized blockchain-based alternatives).



Newer platforms are marketing the same arguments against Ethereum that Ethereum used to distinguish itself from Bitcoin – namely that they add greater functionality and throughput (i.e. EOS).

EOS recognized that users and smart contract developers do not, at least currently, care about architectural decentralization and “sound money”. EOS threw out the entire Bitcoin ethos that Ethereum attempted to preserve by (1) removing transaction fees entirely, (2) paying block producers with a potentially infinite token supply schedule, and (3) limiting the validating nodes to 21 supercomputers. This dramatically increases the transaction throughput. We do not think this is a long-term winning strategy, but in the near-term it can deplete significant market share from Ethereum.

Additionally, if Ethereum becomes effectively architecturally centralized, it is no longer just competing with Bitcoin and other crypto-assets, but also AWS and Azure which are cheap to use, scalable, more secure, better developed, etc., and already have a robust competitive moat.

The accessibility and openness of centralized services like AWS and Azure are largely glossed over by Ethereum and the broader crypto-asset industry. Azure’s consensus products allow greater than 64 write nodes in a consensus cluster, millions of compute nodes, and greater than 2 million transactions per second, while maintaining a degree of “immutability”<sup>6</sup>. Additionally, costs are of

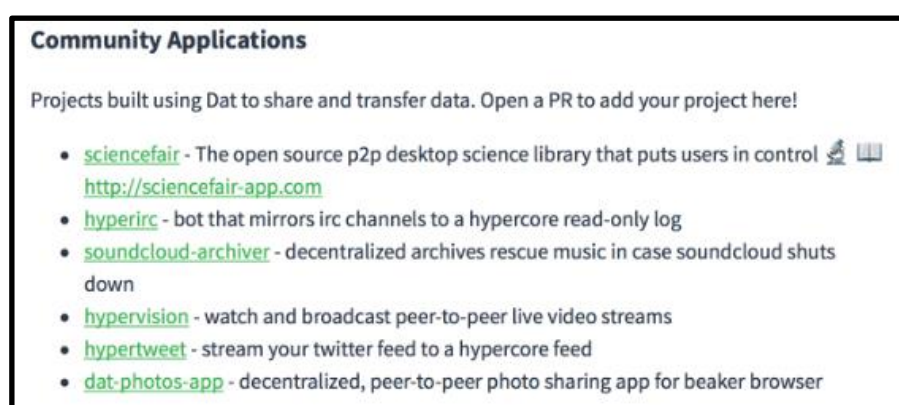
<sup>6</sup> Immutable legally, not like Bitcoin-type immutability. In these consensus environments, fraud can be “undone”, but as long as contractual guarantees are in place about the operation of the system, only certain actions can cause things to be undone.

course hardly comparable as **Ethereum is roughly 1 million times as expensive for computation and storage as compared to these centralized services.**

## **Other Competition**

There is clearly market demand for architectural decentralization – independent of logical centralization. There are many protocols attempting to fulfill this demand at a lower cost than ETH – which is feasible once the expensive (and unnecessary) burden of logical centralization is removed.

Dat Project is a great example of an architecturally decentralized, but a politically and logically centralized, peer-to-peer platform. Some example applications on Dat are below, none of which use a blockchain or token.



Source: [github.com/dat-land/awesome-dat](https://github.com/dat-land/awesome-dat)

The market also severely underestimates the potential for Bitcoin itself to support decentralized applications. Rather than creating a full new network, several projects have looked towards using Bitcoin's existing, secure, decentralized blockchain as the base layer to anchor or tie their applications to. Sidechains, Lightning Network, Agoric protocol, strong federations, and the Fabric Network are examples of DApp systems that provide "Ethereum-esque" functionality while leveraging Bitcoin's blockchain (and without creating a new token).

## **Ethereum Layer-2**

Ethereum could hypothetically evolve into a network with architectural decentralization and relatively low fees. Ethereum's network strain can be resolved if most or all activity can shift to a second layer above Ethereum. But we believe there is little to no chance this is possible in the near-term.

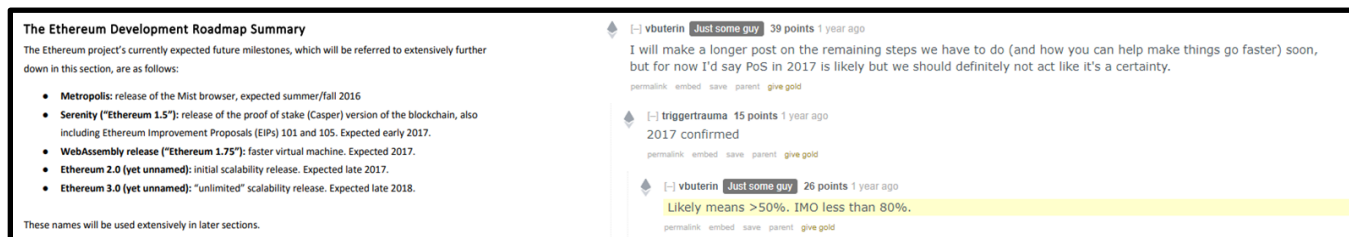
Ethereum platform developers have historically missed and delayed deadlines. In 2016, Vitalik put out a roadmap predicting WASM's<sup>7</sup> implementation in 2017 and "Unlimited Scalability" in late 2018. Later in the year, he predicted a greater than 50% likelihood of Casper<sup>8</sup> in 2017. Proof of Stake, having

<sup>7</sup> A means by which to simplify how the Ethereum virtual machine is implemented.

<sup>8</sup> A lightweight consensus algorithm (proof-of-stake).

been discussed since 2014, is now anticipated in 2019, and Sharding, having been discussed since 2016, is now anticipated in 2020.

The most optimistic estimates suggest that Ethereum's Layer-2 and other broad scaling solutions will not be fully functional, tested, or capable of supporting the most popular DApps for roughly another two years. With the launch of certain Ethereum DApps and competing platforms rapidly approaching, two years will be 1½ years too late. By then, Ethereum will have become effectively centralized or applications will have already switched platforms.



The screenshot shows two parts. On the left is 'The Ethereum Development Roadmap Summary' which lists milestones: Metropolis (summer/fall 2016), Serenity (Ethereum 1.5) (early 2017), WebAssembly release (Ethereum 1.75) (expected 2017), Ethereum 2.0 (yet unnamed) (expected late 2017), and Ethereum 3.0 (yet unnamed) (expected late 2018). On the right is a forum post by vbuterin titled 'Just some guy' with 39 points, discussing the timeline and the likelihood of PoS in 2017. Below it is a comment by triggertrauma with 15 points, stating '2017 confirmed'. Another comment by vbuterin with 26 points says 'Likely means >50%. IMO less than 80%'.

Source: Vitalik Buterin, *"Ethereum Platform Review"*

## iv. Ethereum Political Centralization Precedents and Risks

Demand for Ethereum as a decentralized application platform is based on its strength of decentralization. We are not only concerned about the increasing architectural centralization but believe the network additionally suffers from political centralization.

### Bitcoin Governance

We believe that Bitcoin is the paragon of maximizing political decentralization for a cryptocurrency.

Satoshi Nakamoto, the pseudonymous inventor of Bitcoin, developed Bitcoin for a few years before fading out of the picture, leaving the project in the hands of a small, diverse team. Many view Satoshi's departure was in the spirit of decentralization as he/she may have understood the risks a "messiah" status could pose (i.e. concentrated influence over the ecosystem).

In the years since, the Bitcoin protocol development process has evolved to preserve the decentralization ethos. Code changes are implemented through an open, dynamic, and meritocratic process for proposing, evaluating, and merging software updates. Prior to merging any new changes, the proposed code must traverse a gauntlet of developer approval rounds, where a single "no" will stop the proposal dead in its tracks. Bitcoin's developers have taken a precautionary approach to any updates, prioritizing soft forks over more contentious hard forks<sup>9</sup>, and requiring wide ecosystem consensus for any materially controversial changes.

<sup>9</sup> A hard fork is a non-backwards compatible consensus change. The old software will not sync with the new blockchain. A soft fork, in contrast, is compatible with the old software (i.e. will have no issues with the new network after the fork).

Bitcoin has optimized for decentralization, trustlessness, and censorship resistance, and as a result, Bitcoin has been very hard to change historically – a feature, not a bug. Typically, censorship resistance is exemplified when governments attempt to shut down a network through regulation and/or policing citizens. In crypto-assets, censorship resistance also extends to obstructing frequent, arbitrary, and/or malicious protocol changes, which has been reflected in Bitcoin’s resilience thus far. This history is what provides strong assurances that Bitcoin’s key parameters will never be modified, such as its fixed 21 million BTC supply. In the past few years, the Bitcoin ecosystem has proven its resilience, vetoing a handful of large, corporate-backed campaigns to change the network including the notable Unlimited, XT, Classic, and Segwit2x proposals.

Ethereum’s ethos and actions on the other hand have historically echoed a stark contrast.

### **Ethereum Governance**

First, we grant that Ethereum as a platform is more politically decentralized than status quo centralized platforms, such as Facebook and Twitter. However, we believe the prevailing market sentiment has greatly overestimated the degree of this decentralization.

One of the clearest indications of Ethereum’s political centralization was The DAO.

In May 2016, The DAO, a “Decentralized Autonomous Organization”<sup>10</sup>, raised \$150 million in ETH (14% of all ETH at the time). Two months later, a bug in The DAO’s public smart contract code was exploited by an unknown attacker who was able to move roughly \$50 million of The DAO’s funds into their control.

Due to the specifics of The DAO entity and how the attack worked, the attacker’s funds could not be moved for several weeks, giving the Ethereum community time to consider solutions. A schism then occurred between:

1. Ethereum users who believed the funds of the original DAO should be returned to investors
2. Those who believed that “code is law”—and that rolling back the hacked funds would create a dangerous precedent and systemic moral hazard

Ethereum is a decentralized platform that runs smart contracts:  
applications that run exactly as programmed without any possibility  
of downtime, censorship, fraud or third party interference.

The Ethereum Foundation decided to hold a vote to determine the appropriate next steps. Only roughly 5% of outstanding ETH ended up participating in the vote. The decision was then made to

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<sup>10</sup> A DAO, ‘Distributed Autonomous Organization’, is essentially a new, decentralized business model for organizing both commercial and non-profit enterprises, with no conventional management structure or board of directors, emerging from a series of Ethereum smart contracts. *The DAO*, specifically, was akin to an investor-directed venture capital fund.

hard fork and return the funds in less than a week. “Code is law” abruptly came to an end. Many users were forced to question the validity of the Ethereum’s marketing – “without any possibility of downtime, censorship, fraud, or third-party interference”.

During The DAO incident, it also became clear that Vitalik Buterin commanded immense power. Amidst the hack, Vitalik was quickly able to convince crypto-asset exchanges to halt all ETH trading. Furthermore, his power and leadership were instrumental in pushing the hard fork forward.

```
[3:41:56 AM] Jesse: why pause trading?  
[3:41:59 AM] Aurélien MENANT: done :p  
[3:42:56 AM] Tristan D'Agosta: That's a pretty serious measure, is the stolen  
ETH moving?  
[3:42:57 AM] Alex Hanin: Can you please elaborate on this pause?  
[3:42:58 AM] dino: ALL EXCHANGES EMERGENCY PAUSE TRADING RIGHT  
NOW  
[3:43:01 AM] Vitalik Buterin: ok can you guys stop trading  
[3:43:05 AM] Tristan D'Agosta: Okay  
[3:43:10 AM] Bill Shihara: Stopping the trading will stop the hacker from  
liquidating. but that may be penalizing legit traders significantly  
[3:43:11 AM] Vitalik Buterin: and deposits and withdrawals  
[3:43:18 AM] dino: ALL EXCHANGES STOP WITHDRAWALS RIGHT NOW  
EMERGENCY  
[3:43:25 AM] Tristan D'Agosta: Okay, not trading then...  
[3:43:38 AM] Jesse: we can do withdrawals. haven't heard the case for  
trading yet
```

Source: [steemit.com/ethereum/@pigeons/conversation-between-vitalik-and-exchanges](https://steemit.com/ethereum/@pigeons/conversation-between-vitalik-and-exchanges)

Vitalik is extremely talented and we have a lot of respect for him in many dimensions. In general, it is very important to have a singular visionary – or better yet, vision – at the helm of a project. However, in the context of decentralized protocols (that are also money), having a single individual with immense amounts of power is inconsistent with the value proposition.

The DAO hard fork was two years ago and not a lot has changed. Vitalik and the Ethereum Foundation are still driving large updates in the network, and they have proposed substantial changes to the infrastructure and consensus rules (i.e. Sharding and Casper/PoS) with virtually zero pushback. It is clear that Vitalik is the de facto CEO of Ethereum.

Similar to the aforementioned architectural decentralization issue, Ethereum has also backed itself into a corner in regards to political decentralization. It likely will not achieve the neutrality of a completely politically decentralized platform like Bitcoin (in the near-term), nor does it have the reliability of having clearly identifiable and known counterparties, albeit with trust like AWS.

## B. Ethereum as a Capital Raising Platform

Data indicates that ETH's price has ascended in the past year not because of any decentralized application use but because it was the easiest platform to implement cheap, massive fundraises via ICOs. In this regard Ethereum has been immensely successful.

However, this success is not sustainable. For one, we believe investors are going to become less inclined to invest in tokens. The token model is flawed (as we will discuss further herein) and as investors further understand the tradeoffs, their demand for tokens will naturally subside. Two, regulatory enforcement will start and dry up most of the ICO landscape. Three, for the legitimate ICOs that are compliant (or just beyond regulatory enforcement), the commoditization of capital raising will pose an even greater threat to Ethereum.

### Tokenize Everything

The "tokenize everything" buzz has engrossed the wallets of speculators worldwide. CoinCreator, a 1-click ICO creator, has alone helped to raise over \$500 million for startups (allegedly). ICOs have so far raised roughly \$20 billion—or 5x the VC equity investment into blockchain startups (just over \$4 billion). Below are the fundraising and valuation sizes of some notable projects:

Name	\$ Raised	% Tokens Sold	Valuation	Date
Ethereum	\$18,439,000	84%	\$22,082,635	Jul-14
Funfair	\$26,000,000	21%	\$123,809,524	Jun-17
Bancor	\$153,000,000	50%	\$306,000,000	Jun-17
Status	\$107,664,904	41%	\$262,597,327	Jun-17
Monetha	\$36,388,800	50%	\$72,777,600	Aug-17
Stox	\$33,350,320	50%	\$66,700,640	Aug-17
Decentraland	\$25,000,000	40%	\$62,500,000	Aug-17
0x	\$24,000,000	50%	\$48,000,000	Aug-17
District0x	\$9,789,541	60%	\$16,315,901	Aug-17
Kin	\$98,500,326	10%	\$985,003,261	Sep-17
Kyber Network	\$49,304,000	61%	\$80,746,806	Sep-17
Enigma Catalyst	\$45,000,000	50%	\$90,000,000	Sep-17
ChainLink	\$32,000,000	35%	\$91,428,571	Sep-17

Source: [techburst.io/structuring-optimal-token-sales-amidst-2017s-ico-mania-27d6ff45cba](http://techburst.io/structuring-optimal-token-sales-amidst-2017s-ico-mania-27d6ff45cba)

There has been tremendous demand for Ethereum as a capital raising platform. Some reasons why include:

1. Tokens are global and liquid, traded 24/7
2. There is no recourse for token holders
3. Spinning up an ICO is cheap and relatively easy – mainly due to the lack of regulatory presence
4. Given the boom in ICO prices and investor composition, the investor diligence is markedly lower than in the traditional equity world
5. Prominent venture capitalists have publicly supported many ICOs over the last year
6. Many believe that tokenized cryptonetworks (with unpegged crypto-assets) will accrue value and displace centralized incumbents

## **i. The Volume of ERC20 ICO Launches Will Likely Collapse as Regulation is Introduced and Enforced**

As we learned from the SEC in 2017, The DAO conducted an illegal security offering and The DAO tokens were securities. In early 2018, SEC Chief Jay Clayton put it more frankly, stating that:

*“...every ICO I’ve seen is a security.”<sup>11</sup>*

He differentiated ICOs from “true cryptocurrencies”: crypto-assets from mined public blockchain networks that have technological substance beyond capital raising. The SEC further clarified that tokens would be regulated per the Howey Test<sup>12</sup>.

It is now indisputable that if a public ICO occurs “pre-product” then there is a required “effort of others” – which makes it a security under the Howey Test. A sample of the highest-valued tokens with “pre-product” ICOs implemented on Ethereum are below, totaling in at a little over \$3 billion in market cap:

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<sup>11</sup> Source: SEC, CFTC Senate Hearing on Blockchain: <https://www.youtube.com/watch?v=4z7VWYOEmQM>

<sup>12</sup> A transaction is an investment contract if: (1) it is an investment of money, (2) there is an expectation of profits from the investment, (3) the investment of money is in a common enterprise, (4) any profit comes from the efforts of a promoter or third-party.

## **Top Ethereum DApp Public ICOs**

<b>Dapp</b>	<b>Market Capitalization</b>	<b>ICO Size (\$)</b>
OmiseGo	\$1,128,840,000	\$21,000,000
Golem	\$486,182,000	\$8,600,000
Augur	\$419,833,000	\$5,140,000
Status Network	\$333,742,000	\$95,000,000
Basic Attention Token	\$270,451,000	\$35,000,000
Bancor	\$212,536,000	\$153,000,000
Funfair	\$165,308,000	\$26,000,000
Kin	\$146,975,000	\$98,800,000

*Source: [coindesk.com/ico-tracker](https://coindesk.com/ico-tracker), [coinmarketcap.com](https://coinmarketcap.com), 6/7/2018, approximate figures*

ICOs will likely never stop entirely, but the volume we saw over the past year will be very difficult to replicate as the required investment (both time and capital) from the issuer increases. Additionally, a higher regulatory bar with more stringent investor qualifications will naturally curtail the number of projects that could successfully ICO.

## **ii. The Commoditization of Capital Raising**

Going forward, Ethereum as a capital raising platform will be challenged by well-capitalized, hyper-specialized platforms that will have (or already have) learned from the kinks, mistakes, and risks of the Ethereum ICO model. Competition will commoditize the capital raising function and diminish Ethereum's market share.

Ethereum's capital raising market share has largely been due to its first-mover advantage. First-mover advantages are sustainable in the presence of either:

1. Habit-based consumer purchases
2. Strong network effects

We believe neither of these exist for capital raising platforms. Blockchain-based capital raising is fairly uncomplicated. Token fundraising in general does not require Ethereum's Turing-Completeness, but just multi-signature capabilities (a common feature of blockchains). This relative ease of implementation lowers the market's barrier of entry.



With more protocols going live, we expect fundraisers to migrate to the platform that is cheapest and that compensates them the most to do so (i.e. the platform investing in their raises).

EOS, for example, has a war chest (after a roughly \$4 billion ICO) for incentivizing DApps to launch on their platform and nearly zero explicit transaction fees. Other well-funded platforms include Tezos, Dfinity, Rchain, and Wanchain. Ethereum's first-mover advantage alone will not be enough to fend off the lower transaction fees and monetary incentive from other platforms.

Ethereum is simply unnecessarily complicated for ICO purposes and Ethereum's richly stateful Turing-Complete contracts have led to a myriad of bugs and other security failures (recall The DAO and the roughly \$300 million Parity multi-sig exploit).

Platforms that embrace centralization by lowering validator count (like EOS or XLM) will be able to facilitate capital raises at lower costs, and platforms built with formal verification from the ground up (like Rchain and Tezos) will likely reduce the frequency of security failures.

\* \* \*

It is clear that Ethereum's highest and arguably only real source of demand right now is as a capital raising platform. This demand continuing is strongly predicated on regulatory agencies ignoring the mania and investors remaining very risk-on. Furthermore, if regulation does not snuff out these new methods of raising capital, new projects are positioning to seize some of this market share.

Lastly, as we will discuss in greater detail below, we do not believe that unpegged crypto assets will accrue value. As investors become more disillusioned with their prospects, the demand side of ICOs will start to subside.

## C. ETH as a Store of Value (SoV)

### “Path to Trillions”: Utility vs. SoV Theses

A large debate in the crypto-asset industry today is what constitutes the “path to trillions” in terms of crypto-asset valuation. The foundation of the “utility path” was the Fat Protocols thesis by Joel Monegro at Union Square Ventures. His assumption is that because of positive feedback loops between utility, speculation, and innovation, DApp platforms will grow faster than the combined value of the DApps built on top.

#### i. **ETH is a Money, Not an Equity**

If crypto-assets were equity (or equity-like), this Fat protocol and “utility thesis” would likely be correct. The most used platforms would likely be the most valuable. But all unpegged (i.e. not convertible or without legal recourse) crypto-assets are money, not equity. The value capture mechanisms of money and equity are very different.

A crypto-asset’s use case is almost always a medium of exchange within a quasi-decentralized economy – *that is money*. That medium of exchange is only useful for paying network service providers to e.g., store data (Filecoin), process an application (Ethereum), or facilitate a transaction (Bitcoin).

Comparing AWS to Filecoin illustrates an important difference between money and equity. AWS charges its users to access their cloud services. Pretending that stock in AWS exists, investors are incentivized to hold AWS stock if (a) AWS is profitable and/or (b) they expect an increase in AWS use and subsequently revenue/profit to grow. This is because greater AWS profit directly translates to higher cash flow, larger dividends, higher liquidation value, etc. Equity holders have legal claims/recourse to this cash flow and as a result there is a strong incentive to hold onto AWS shares across time.

FIL, Filecoin’s native asset, is required as the medium of exchange in Filecoin’s network. Fees denominated in the asset are collected by storage providers as their storage is used. A FIL holder can either (1) “spend” the token by sending it to Filecoin storage providers in exchange for storage services or (2) “exchange” the token for another asset (where there is a market). Unlike AWS, holding FIL does not correspond to an ownership stake in the network’s service providers. As a FIL holder, there is no entitlement to any of the service provider profits. There is not even a guarantee that the FIL is worth a fixed amount of storage space. There is no *direct* mechanism that links Filecoin network use to FIL price like AWS use is linked to its share price (through cash flow). More people want to hold AWS stock because the dividend yield and liquidation value increases as a function of its usage and revenue. The utility hypothesis incorrectly presumes the same about FIL and ETH. ETH is similar in this regard, as the fuel for a decentralized application compute and storage network.

Usage alone will not be enough to support a trillion-dollar valuation because it will be possible to use a protocol without holding the asset across time. When decentralized exchanges and atomic swaps come online (or any low friction way to trade between assets), why would a user hold a volatile asset when they could seamlessly trade into it only when necessary?

One argument made for the “utility thesis” is that token assets are like taxi medallions, and users can expect their value to increase as people demand them for usage. However, taxi medallions, unlike ETH and FIL, are not used as a means of payment for taxi rides but are necessary to hold by service providers **throughout the duration of operation**. Additionally, and most importantly, there is no easy way to trade in and out of medallions when not operating as a driver. ETH, FIL, and the majority of tokens are only necessary at time of payment and will only be traded into as necessary. Thus, whereas taxi medallions have a strictly fixed supply, the free supply of tokens will increase over time as they change hands more and more frequently – this is known as the velocity problem.

Many crypto-asset investors mistakenly believe that tokens will accrue value like taxi medallions or equity and have been willing to hold onto the assets with expectation of high returns (eventually). This by definition is speculation. But as reality falls short of expectations, speculators will reevaluate which assets they should be holding. Tokens without strong liquidity and security guarantees will likely be the first to suffer. As this begins to manifest, trading activity will be entirely one way – on the sell side – to the point where utility tokens will become a burden for the network as liquidity vanishes. At some point speculative investing needs to be supported by reality because speculative investors have a finite amount of patience in realizing returns.

## ii. High ETH Market Cap Necessitates SoV Status

To justify valuations north of \$100 billion, crypto-assets need to be on a path to become a store of value. Definitionally, this is the case. If the bet is that (an unpegged) crypto-asset becomes worth \$10 trillion, you are betting that \$10 trillion in wealth will be held in it eventually.

There is a somewhat widespread notion in the crypto-asset space that money is only valuable because it is useful as a medium of exchange. In reality, the opposite is true. If money were simply used as an exchange medium, and not held as savings, any increase in its value would immediately be negated as the user sells out of the asset. Demand for holding is key.

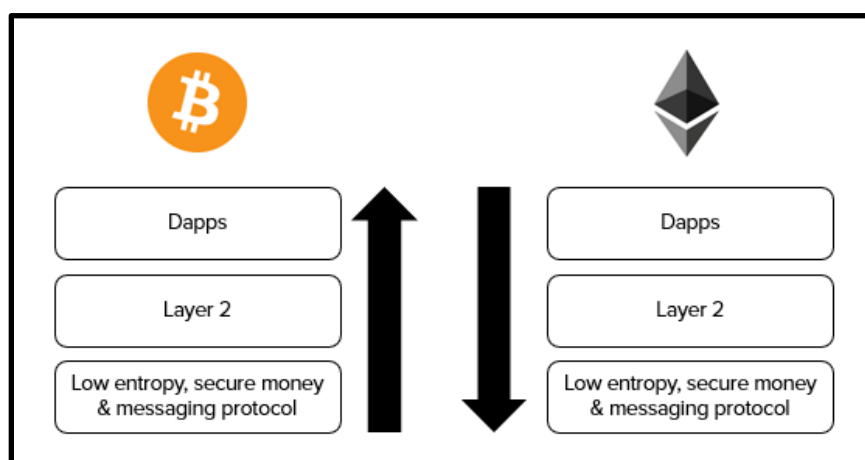
In other words, the only way for the market cap of a money to go up in value is if more people *demand to hold it as savings*.

We believe, over the long run and especially in the internet age with the myriad of options for payments and MoE, the only discriminator between different crypto-assets is their ability to retain value as a SoV. The most valuable crypto-asset will be the one that is best for saving.

### iii. ETH Cannot Outcompete BTC Directly as Digital Gold

As discussed, the winning crypto asset will be demanded to be held the most now *and* in the future. The market has argued that there are two different paths towards getting users to do so and towards SoV viability:

1. Optimizing first for the necessary and ideal conditions of a SoV (i.e. digital gold), later building more expressive features on top (“bottom-up”)  
or
2. Optimizing first for feature-richness, then implementing and/or enhancing SoV properties down the road (“top-down, utility thesis”)



We believe that the first, “bottom-up” or direct approach is substantially more likely to win and hold the SoV market, and Ethereum is approaching the battle backwards.

The “bottom-up” approach Bitcoin is taking is often misinterpreted as being overly conservative or “utility-adverse”. This however strawmans the approach and fails to understand the nuance of value accrual. An SoV asset does need a degree of utility such that it has liquidity (or at least future liquidity), but an asset that has no demand for holding will not have any sustainable utility demand. Bitcoin as a “digital gold” does not preclude utility. In fact, its programmability, despite intended limitations, still provides a major competitive advantage vs. gold and USD.

The Bitcoin ethos is predicated on the notion that people will hold their wealth in the most objectively secure, decentralized, immutable, scarce, and in-demand asset – a combination of characteristics that have never existed for physical assets. From the start, Bitcoin optimized for SoV viability.

The top-down approach that assets like Ethereum have taken prioritizes feature richness at the expense of “digital gold” characteristics. Ethereum’s top-down approach is predicated on the idea that

people will hold the asset that enables the most application usage at any given time – “the utility path to trillions”— which we discussed earlier and believe does not hold water.



It is useful to think about a potential user weighing the decision of where to lock up \$1 million for 10 years. He/she has two options:

1. An asset that has historically resisted change, withstood several well-equipped attacks, has the most liquidity, is the most secure, and has a static final supply and monetary policy – but currently has less broader application utility in the medium-term.

or

2. An asset that is still highly subject to change, has unclear monetary policy, has had numerous hacks, has many competitors emerging – but potentially has “more” utility in the near-term.

Investing in a SoV is answering this question above, and we think it ultimately comes down to eight main factors described below:

		
<b>Centralization</b>	<ul style="list-style-type: none"> <li>• Low cost to run a full node; &gt; 100k nodes</li> <li>• Prioritizing decentralization above all else</li> <li>• Pseudonymous founder</li> </ul>	<ul style="list-style-type: none"> <li>• Increasingly costly to keep a full node synced; &lt; 20k nodes</li> <li>• Centralized figurehead and organization</li> </ul>
<b>Monetary Policy</b>	<ul style="list-style-type: none"> <li>• Max supply 21m</li> <li>• Original intent, extremely unlikely to change</li> </ul>	<ul style="list-style-type: none"> <li>• Max supply TBD</li> <li>• Future supply ‘promised’ to be &lt; 26% annually in ICO</li> <li>• Estimated ~0-2% annually after move to PoS (timing TBD)</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>• #1 Proof of Work based cryptocurrency by hash rate</li> <li>• Minimized base layer blockchain and transaction complexity to reduce errors and attack vectors</li> </ul>	<ul style="list-style-type: none"> <li>• #2 hash rate PoW cryptocurrency – plans to move to PoS (exact details TBD – thus untested)</li> <li>• Turing complete programming language has led to numerous errors, bugs, and hacks</li> </ul>
<b>Usability</b>	<ul style="list-style-type: none"> <li>• Higher historic average fees, slower blocks</li> <li>• Layer 2 network progress beyond all other layer 2 networks which will very significantly reduce transaction fees and times</li> <li>• Harder to develop ‘feature-rich’ apps</li> </ul>	<ul style="list-style-type: none"> <li>• Historically lower average fees (although increasing), faster blocks</li> <li>• Easier to program and launch custom applications</li> </ul>
<b>Durability</b>	<ul style="list-style-type: none"> <li>• Live since January 2009 (99.992% uptime)</li> <li>• Known for resilience to change</li> </ul>	<ul style="list-style-type: none"> <li>• Live since July 2015</li> <li>• Known for constant change, iteration, experimentation</li> </ul>
<b>Fungibility</b>	<ul style="list-style-type: none"> <li>• Highly divisible but low fungibility with transparent blockchain and linkable transactions (researching privacy solutions)</li> </ul>	<ul style="list-style-type: none"> <li>• Highly divisible but low fungibility given transparent blockchain and linkable transactions (researching privacy solutions – may iterate faster)</li> </ul>
<b>Regulation</b>	<ul style="list-style-type: none"> <li>• Not a security, no initial fundraiser</li> </ul>	<ul style="list-style-type: none"> <li>• Not a security, did ICO (may be illegal securities offering)</li> </ul>
<b>Liquidity</b>	<ul style="list-style-type: none"> <li>• #1 crypto asset by liquidity</li> <li>• Single digit billions of dollars a day (globally 24/7)</li> <li>• Fiat on/off ramps, OTC, diverse exchanges</li> <li>• CBOE and CME futures</li> </ul>	<ul style="list-style-type: none"> <li>• #2 crypto asset by liquidity</li> <li>• Single digit billions of dollars a day (globally 24/7)</li> <li>• Fiat on/off ramps, OTC, diverse exchanges</li> </ul>

If you are holding a store of value, you are betting on the market cap staying the same or increasing in the future (that is, its value not falling). Given the above framework, it is a bet that the same amount

of or more wealth will be held in the asset in the future. This is a bet on something that is not necessarily intrinsic to the asset, but on what other people believe in the future. Throughout history, the market has tended to converge on stores of value with very specific features.

Money only has value because everyone else thinks it has value. Absent the shared belief, there is no intrinsic value in holding a money. Equity, on the other hand has value independent of the market's belief because of its convertibility into assets and its support by cash flows. This is the key difference. Unlike equities where you want to act independently of the market's belief, with currencies you want to converge on what the market is telling you. As more users make the calculation above, they will all tend to converge on the same asset. Holding money is inherently a bet on what other people will hold.

Ethereum would have a higher chance of becoming a SoV if it launched at the same time as Bitcoin, but it is far behind. The token that has been the most valuable from inception to time T-1, and in current time T, is most likely to be the most valuable at time T+1. Bitcoin not only has stronger SoV properties, but it also has a six-year head start, greater security, and more liquidity<sup>13</sup>.

#### **iv. Multiple Crypto-Asset SoVs is Unlikely**

It is very likely that all crypto-asset SoV demand will concentrate into a single crypto-asset. In our opinion this will likely be Bitcoin or a digital asset (future or existing) that is very similar to Bitcoin – prioritizing SoV properties from the onset.

There are strong positive feedback loops between liquidity, acceptance, and value. Preferences on what to hold as a store of value tend to favor the most widely acceptable and recognized commodity. This is highly advantageous to the economy for the same reasons that a money economy is superior to a barter economy – it increases the social scalability of the market.

Empirically this has been the case with gold. Absent legal tender laws, the free market has tended to converge on one dominant money for long-term value storage (especially between similar assets). Yes, a silver market still exists today, but its value is only \$50 billion compared to gold at \$8 trillion – a difference of two orders of magnitude. Historically, governments have had a hard time maintaining the peg between the two as it quickly becomes an unstable equilibrium when liquidity advantages cause holders to significantly prefer one over the other. Over time, the existence of two competing currencies is an unstable equilibrium and value will tend to accrue to a single leader.

SoV convergence will be accelerated for crypto-assets because of the role the asset value plays in securing the network. As the value of a crypto-asset falls, its network becomes increasingly vulnerable to attacks or failures. As the market reacts, savvy investors will recognize the emerging winner and switch to it not only because of its relative, increasing social scalability, liquidity and value

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<sup>13</sup> Based on the above argument, how is Bitcoin able to compete with the USD despite the massive liquidity advantage of USD? BTC can compete because it has handful of unique and arguably superior monetary features (such as provable scarcity).

but also because the more valuable network will provide stronger security guarantees. This feeds back into the falling assets' demise.

Blockchain protocols add a litany of other network effects to the equation, further exaggerating this dynamic:

- **Protocol Network Effects:** Protocols are languages. Languages standardize. A non-technical understanding of Bitcoin still has a steep learning curve despite being non-technical. In that sense, it would not be easy to learn *another language*. In more literal terms, building with Bitcoin requires specialization in interfacing with Bitcoin, among peers who are also specialized in Bitcoin.
- **Monetary Network Effects:** Positive feedback loops between liquidity and value.
- **Security Network Effects:** Highest hashrate means highest security means better value storage means more value stored. This positively feeds back.
- **Lindy Effect:** Additional periods of survival for technology implies longer remaining life expectancy. Based on this, we do not think there will exist both a valuable distinct “smart contract protocol” and “store of value protocol”. The market is overvaluing distinct smart contract platforms and overprescribing value diversification in a winner-take-all value market. .

## v. The Rudimentary $MV=PQ$ Model Cannot Justify Ethereum's Valuation

If we dismiss the SoV argument for crypto-asset valuations, we must look at ETH as “fuel” for smart contracts. The quantity theory of money,  $MV=PQ$ , is the most appropriate model for this utility framework. John Pfeffer modeled out  $MV=PQ$  (with reasonable assumptions) for ETH in [his December 2017 paper](#).

12/23/17 Ethereum Gas Fees	\$	972,603								
2017 Annualized Economic Activity	\$	355,000,000								
Theoretical Growth Rate	0% Annual Growth	25% Annual Growth	50% Annual Growth	100% Annual Growth	150% Annual Growth					
2027 Economic Activity	\$	355,000,000	\$	3,306,195,140	\$	20,471,088,867	\$	363,520,000,000	\$	3,385,543,823,242
Velocity	Theoretical Network Value									
3	\$	118,333,333	\$	1,102,065,047	\$	6,823,696,289	\$	121,173,333,333	\$	1,128,514,607,747
5	\$	71,000,000	\$	661,239,028	\$	4,094,217,773	\$	72,704,000,000	\$	677,108,764,648
7	\$	50,714,286	\$	472,313,591	\$	2,924,441,267	\$	51,931,428,571	\$	483,649,117,606
9	\$	39,444,444	\$	367,355,016	\$	2,274,565,430	\$	40,391,111,111	\$	376,171,535,916
11	\$	32,272,727	\$	300,563,195	\$	1,861,008,079	\$	33,047,272,727	\$	307,776,711,204

Even if ETH economic activity doubled each year for 10 years – ultimately yielding a 1000-fold increase at a velocity of 7 (roughly M2's) – ETH would be worth \$52 billion in 10 years. That's **only about 15% more than its current market cap of \$45 billion, even with very conservative velocity assumptions**. It should be clear, if not alarming, why ETH needs to become a SoV. Any current demand for ETH as a utility is not nearly enough to support its current market cap.

## IV. Why Short Now: Upcoming Catalysts

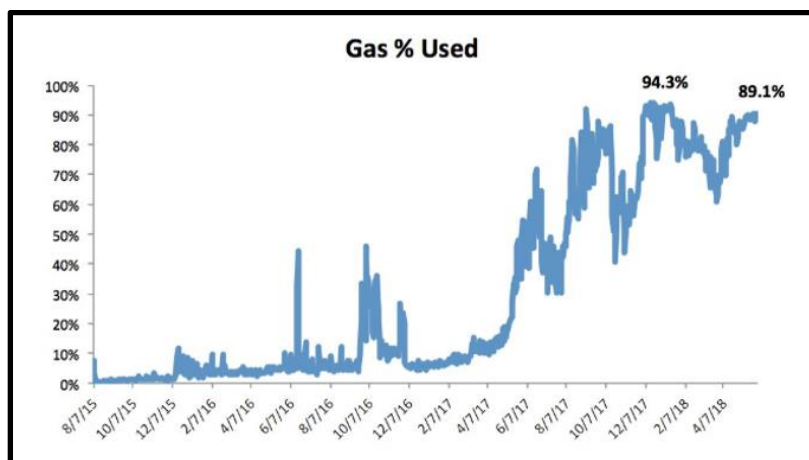
Speculative markets are driven by narratives. A thesis to short a speculative asset must be based on the collapse of a prevailing narrative and should be catalyst driven. An added benefit of the ETH short is its ability to hedge out broader market risk while keeping us exposed to the upside that can result from a market decoupling.

We have seen that there exists a vast disparity between current speculative ETH prices and the reality of Ethereum today. Below are several major catalysts that we believe will subvert the prevailing Ethereum narrative and present an attractive shorting opportunity:

1. Ethereum's network resource strain will collide with the imminent launch of major DApps (e.g., Augur). This collision will publicize Ethereum's scaling and centralization concerns.
2. An ICO regulatory crackdown is due, which will dry up most of ETH demand and trigger market reflexivity. This will lead to selling pressure as ICO investors and organizers exit ETH, furthered by decreasing ETH demand from ICOs.
3. Ethereum DApp and capital raising platform competitors are increasing in number and ramping up, which will diminish ETH's large value proposition.
4. SoV market dynamics will further manifest.
5. Bitcoin needs to lead the next sustained crypto-asset bull market.

### 1. Ethereum Fees and Node Operating Costs are Rising Before the Imminent Launch of Major DApps

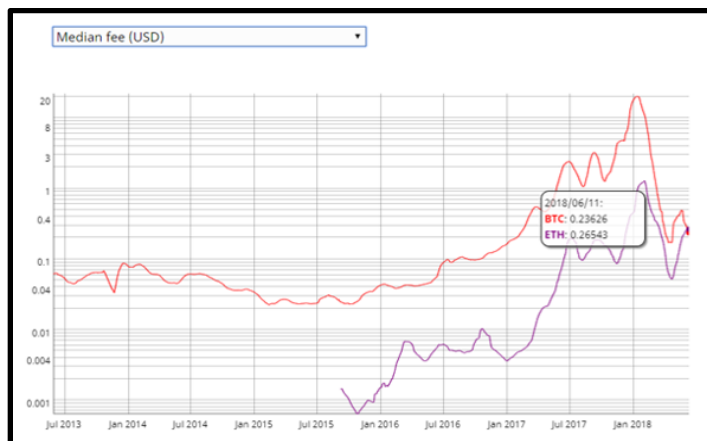
Despite Ethereum having zero DApps with greater than 5,000 daily active users, block space is almost at peak capacity.



Source: [etherscan.io](https://etherscan.io)



In addition to this capacity crunch, ETH fees recently surpassed BTC with a median transaction fee of \$0.27 vs BTC's at \$0.24. We are also at the precipice of several long-awaited DApp launches and expansions – such as Funfair, Augur, and Gnosis. As these DApps launch and as block size continues to fill up, the fee situation will be exacerbated.



Source: [coinmetrics.io](https://coinmetrics.io)

Ethereum's block size can be increased by miners to account for the influx of transactions. This would help reduce the median transaction fee but comes at the expense of increased full node operating costs (increasing the system's centralization risks).

On the other hand, if block size is kept low to facilitate nodes, transactions fees will rise even further. The block size acts as a "regulatory" tax on the system to reduce full node externalities and that tax gets passed directly onto users. In effect, DApp growth and usage would be negatively impacted with terrible UX.

Ethereum is stuck between a rock and a hard place before its Layer-2 launch. On one hand, they can further centralize the system by raising the gas limit. On the other, they can limit gas and let fees rise, subsequently hurting DApp growth and usage.

We think Ethereum is likely to take the first approach in the near-term. Ethereum *needs* low fees for two reasons:

1. Current demand is very elastic because no Ethereum DApp has been a "killer" so far
2. Part of the strategy of competitors like EOS is to eat their own fees to capture market share

This catalyst will happen in the near-term because of the imminent launch of certain Ethereum DApps deemed to be potential killers. It is reasonable to expect new highs in DAU but also increased block congestion and fees. To preserve its DApp platform narrative and market share, Ethereum must raise block size, centralizing its network of nodes.

Augur, a decentralized prediction market platform founded in 2014, has been one of the most anticipated projects and touted “killer DApp” in the market since its ICO in 2015. Augur launched on July 9th and features one of the most complex DApp architectures to-date. This complexity is not without its tradeoffs, leading to extremely high gas prices and costs. In the first few days, users have spent substantial configuration time and >\$30 to launch any prediction market. Increased demand for Augur transactions will only lead to further accompanying fee increases.

The launch of Augur, supposed to garner massive positive attention and interest for Ethereum, may do the exact opposite. The application is very slow, expensive, and likely prone to unexpected bugs, which every rogue hacker will be looking to expose after The DAO incident.

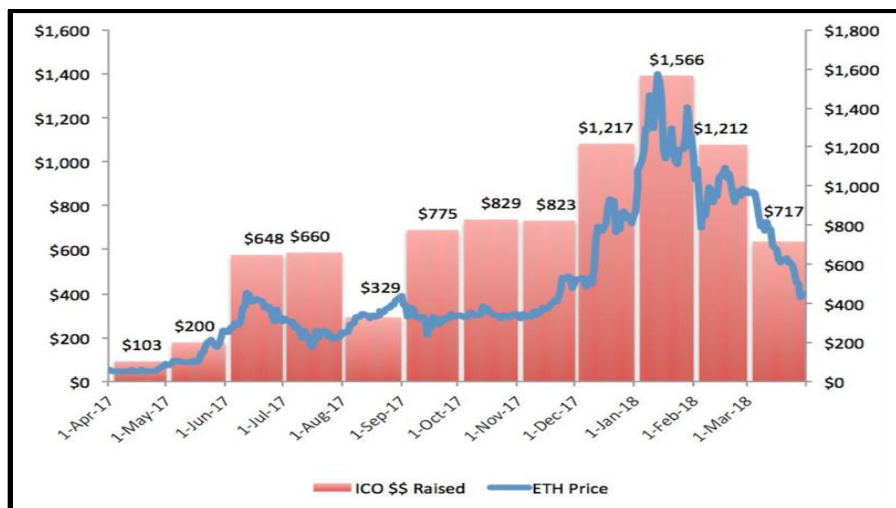
Augur is also using INFURA nodes, further centralizing the network and increasing reliance on them as a trusted third party. The general value proposition of Augur was to create an untrusted, censorship resistant prediction market – because centralized platforms like Intrade and PredictIt already exist. But if Augur completely relies on a US corporation for transaction validation (INFURA), this feature may not actually exist. The resolution source (oracles / REP token holders) and distribution also will be a major source of centralization risk underpinning the network.

## 2. The ICO Regulatory Crackdown is Due

Although the SEC recently declared that ETH is not a security, the same cannot be said for the majority of the ICOs it hosts. In addition to representing textbook failures of the Howey Test, the rampant investor risks to participating in ICOs means regulatory action is due. We are uncertain of the extent of this action, but it could easily outlaw the “decentralized capital raising model” entirely, impacting Ethereum’s capital raising platform competitors and their ICOs as well.

### Reflexivity from Capital Raising and Projects Selling ETH

If ICOs are deemed to be illegal, it may catalyze a substantial reflexive unwind in the market.



Source: [coinmarketcap.com](https://coinmarketcap.com), [tokendata.io](https://tokendata.io)

Investors use ETH to participate in ICOs. As ETH price declines, two things happen:

1. Ethereum ICOs become less attractive ventures
2. ICOs that hold ETH lose runway

These are reflexive.

If ICOs are a major source of ETH demand, then:

1. Decreasing ICO demand hurts ETH price
2. Projects that fundraised via ICO contribute more sell pressure as they diversify holdings to minimize loss (from holding ETH) and lock in a static capital base

We saw a glimpse of this recently as people became aware that EOS was selling large blocks of the ETH they had raised in their ICO. ETH and ICO token balances residing in ICO issuer treasuries represent a relatively large percentage of the total ETH and individual token supplies. As such, sudden, sizeable liquidations can severely hurt the price.

Some select applications and ETH token balances are below. 2% of total outstanding ETH may not look like a large sum, but given low liquidity, sales from these major projects will cause substantial selling pressure.

Top ETH Accounts by Balance			
Rank	Address	Balance	Percentage of ETH
24	0xf0160428a8552ac9bb7e050d90eeade4dd52843   DigixCrowdSale	466,648 ETH	0.47%
31	0x7da82c7ab4771ff031b66538d2fb9b0b047f6cf9   GolemMultisig	369,023 ETH	0.37%
36	0x9937dbb2128b55c44d8af7bf36fd76796a814cf4   EOS-Owner	328,645 ETH	0.33%
39	0x3bfc20f0b9afcace800d73d2191166ff16540258   Polkadot-Multisig	306,276 ETH	0.31%
46	0xcafe1a77e84698c83ca8931f54a755176ef75f2c   Aragon_Multisig	240,985 ETH	0.24%
52	0xc78310231aa53bd3d0fea2f8c705c67730929d8f   SingularFunds	201,130 ETH	0.20%
57	0x851b7f3ab81bd8df354f0d7640efcd7288553419   Gnosis-AuctionWallet	194,483 ETH	0.19%
81	0x376c3e5547c68bc26240d8dccc6729fff665a4448   Iconomi-Multisig	114,939 ETH	0.11%
273	0x185f19b43d818e10a31be68f445ef8edcb8afb83   TenXMultiSig	42,485 ETH	0.04%
301	0xd20e4d854c71de2428e1268167753e4c7070ae68   districtOxMultiSig	39,943 ETH	0.04%
303	0x1706024467ef8c9c4648da6fc35f2c995ac79cf6   HeroWallet	39,702 ETH	0.04%
310	0x606af0bd4501855914b50e2672c5926b896737ef   ZRX-Org	38,929 ETH	0.04%
311	0xebbd58cd1c31c08ef7a17337c264ba502762e993   AirSwapPreSale	38,907 ETH	0.04%
319	0x9d217bcbd0bfae4d7f8f12c7702108d162e3ab79   BloomMultiSigWallet	37,455 ETH	0.04%
355	0xc87b1bf162c1719e3ffdf34995d1853192d6633b   DecentBetMultiSigWallet	31,362 ETH	0.03%
356	0x7e6614722614e434c4df9901bab31e466ba12fa4   MysteriumDev	31,122 ETH	0.03%

Source: [etherscan.io/accounts](https://etherscan.io/accounts)

### 3. Ethereum DApp and Capital Raising Platform Competitors are Ramping Up and Increasing in Number

#### DApp Platform Competition

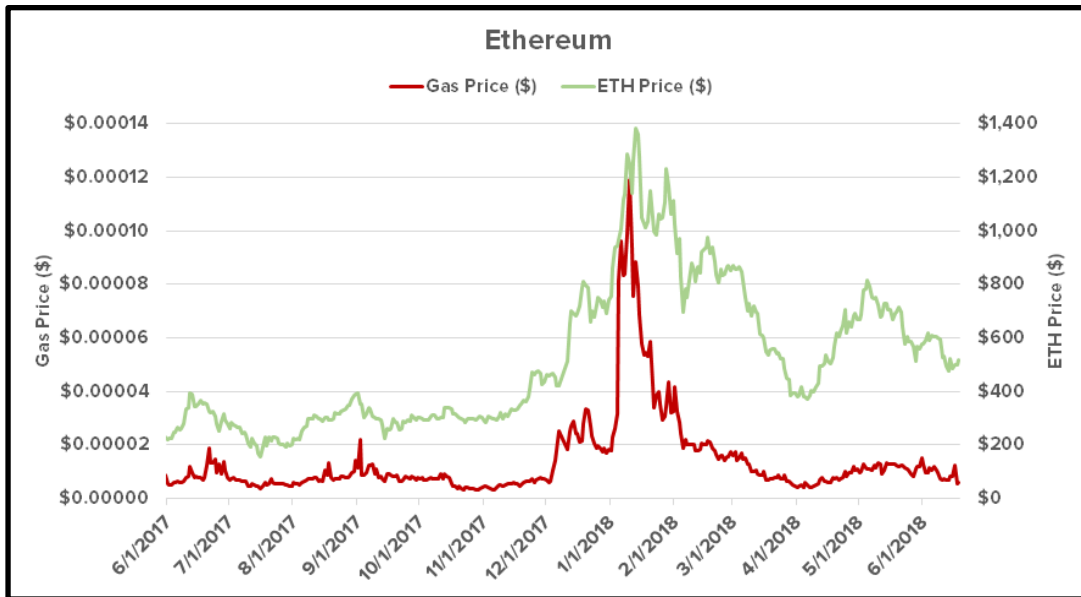
As the ecosystem continues to develop, we believe that each blockchain will become increasingly abstracted to end users (both consumers and developers). Users will interact with the chain through a Web 3.0 interface and decentralized exchanges that seamlessly swap into whatever token necessary. A user will not care whether they are using Ethereum, EOS, Neo, or Dfinity. They will use the platform with their favorite applications and the best user experience (fees, speed, etc).

We have no reason to believe all or most DApp development will occur on Ethereum versus the myriad other application platforms live now or soon to come. Interoperability protocols and Web 3.0 interfaces enable simultaneous use of multiple chains. Thus, as we ultimately see more smart contract use, we will also likely see more commoditization and specialization between each platform. Applications will choose platforms based on tradeoffs between security, scalability, and flexibility and leverage interoperability protocols to “A/B” test the market in real-time. Multicoin Capital, lays out the “smart contract network effect” fallacy well here.

Over the short-term, we think the winner of the application platform battle is likely to tradeoff a degree of decentralization in favor of scalability and cost because strong decentralization is not necessary for most applications. The EOS launch exemplifies more of what is to come.

The robust tooling that ETH has already developed – Truffle, Metamask, etc. – is often cited as a source of potential network effects. However, they may actually contribute to Ethereum’s disadvantage, at least over the near-term. DFINITY, a competing blockchain that transacts at least an order of magnitude faster than Ethereum on its test network, is launching with a different virtual machine called EWASM. Instead of bootstrapping a virtual machine from scratch like Ethereum did, EWASM is supported by both Google and Mozilla and shares the tooling and community ETH has developed over the years – right out of the box. Ethereum developers are held up in attempting to implement something similar.

We believe the elastic Ethereum block space demand (i.e., demand for it as an application platform), will move elsewhere very soon. Ethereum’s last fee spike in December (following the Cryptokitties launch) brought the apparent flaws of the network to light and helped precipitate the fall in usage and value since.

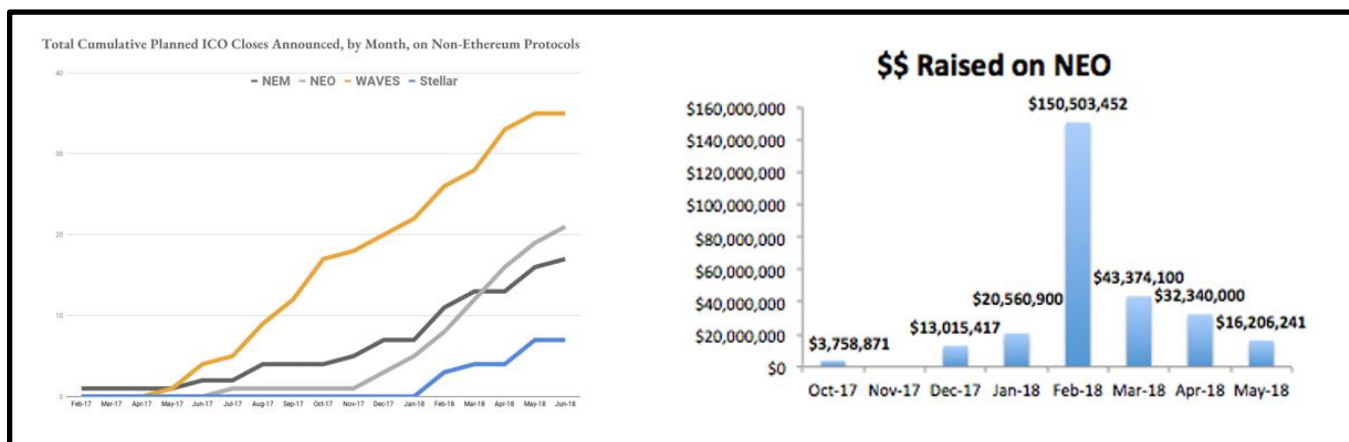


Source: [etherscan.io](https://etherscan.io)

Ethereum application development will be further driven away upon another fee spike. Cheaper, alternative application platforms are standing by with open arms.

### **Capital Raising Competitors**

As discussed earlier, we expect Ethereum's capital raising moat to be commoditized and hence diminished over time. This is happening already, and project launches on the horizon will catalyze this process further. Waves, NEO, Stellar, and NEM are just a few examples of alternative blockchains underpinning a robust pipeline of ICOs. Projects on top of NEO alone have now raised almost \$300 million. Ethereum is no longer the only game in town to raise "decentralized" capital nor is it necessarily the best suited.



Source: New Alchemy Research, TokenData

In addition, many more well-capitalized competitors are either live today or launching soon, including: Dfinity, Qtum, Tezos, Wanchain, Achain, Lisk, and Rchain.

As other platforms begin eating into Ethereum's capital raising platform market share, a positive feedback loop will kick in. Investors will need to hold less ETH to invest, and projects in the market will have less ETH locked up from investments. This will feed into the reflexivity, depressing the Ethereum price further. This is assuming, of course, that the "decentralized capital raising model" does not go completely extinct when regulatory agencies decide to crackdown.

#### **4. SoV Market Dynamics Will Further Manifest**

The crypto-asset market today is largely comprised of retail and tech investors. While tech investors are chasing the "next Bitcoin" dragon, retail investors are hunting for the highest volatility assets (with or without knowing it). The price of any asset reflects the current investor base's views at any given time. Investor composition, therefore, is a significant reason for ETH's mispricing.

We are at the precipice of veteran institutional capital entering the market, and this capital will see through the mania. They may not shun platforms like Ethereum entirely, but given their understanding of currencies within macroeconomic systems and the robustness of the BTC investment ecosystem (futures, increased liquidity, etc), we believe they will be overweight BTC relative to ETH.

At the same time, we continue to see more investors (who have been burned by altcoins) begin to understand and articulate a similar SoV thesis to what we laid out above. As the SoV thesis continues to take hold, we expect more market participants to adopt a more sophisticated risk framework – one that views BTC as their internal cost of capital.

ETH has a tenuous base of holders (especially relative to BTC). The Ethereum community is willing to concede that many DApp platforms could ultimately exist – and its investors are seemingly okay with market share leakage. As many alternative platforms with strong backing continue to launch, we think this community will at the very least diversify into them. DFINITY, for example, will likely garner a substantial amount of investor interest to the detriment of Ethereum.

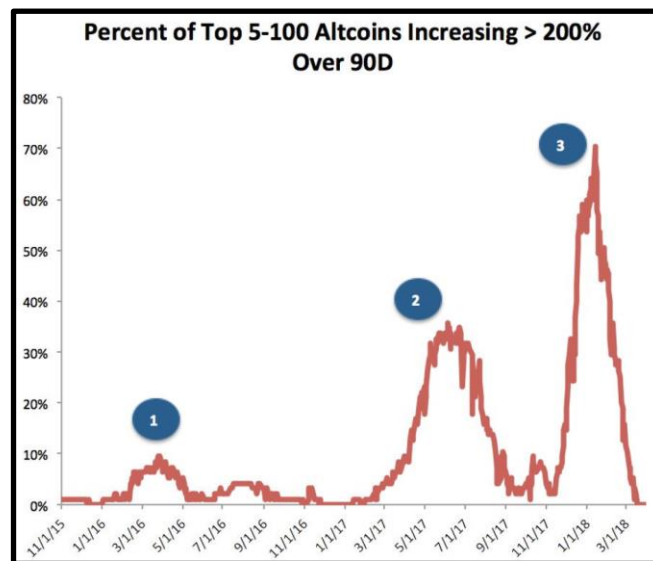
Much like the hottest altcoins of five years ago, crypto-assets that fail to deliver on and substantiate community interest will die off. Crypto-asset communities without a cohesive philosophical foundation have faded away uneventfully since 2013. We believe the current marketplace has underestimated how quickly the attention of this ecosystem moves onto the "next big thing".

Asset	June 2013 Price (BTC)	June 2018 Price (BTC)	+ / -
BTC	1.00000	1.00000	0.0%
LTC	0.02348	0.01567	-33.2%
NMC	0.00573	0.00022	-96.1%
PPC	0.00113	0.00025	-77.9%
NVC	0.03242	0.00043	-98.7%
FTC	0.00105	0.00001	-98.6%
DVC	0.00000	0.00000	-100.0%
TRC	0.00188	0.00001	-99.3%
FRC	0.00016	0.00000	-99.4%
CNC	0.00048	0.00000	-100.0%
BQC	0.00005	0.00000	-100.0%
WDC	0.00013	0.00000	-99.1%
MNC	0.00052	0.00000	-99.4%
BTB	0.13380	0.00156	-98.8%

Source: [coinmarketcap.com/historical](https://coinmarketcap.com/historical)

## 5. Bitcoin Will Lead the Next Sustained Crypto-Asset Bull Market

We do not believe that a crypto-asset bull market is possible unless it is led by BTC. Crypto-asset markets move in well-defined cycles. And each cycle has been more exaggerated than the last. The below metric (inspired by Tom Lee at Fundstrat) helps to show the typical market cycle. The chart below shows the percentage of the top 5-100 altcoins up 3x in the last 90 days, a clear representation of the crypto market cycle:

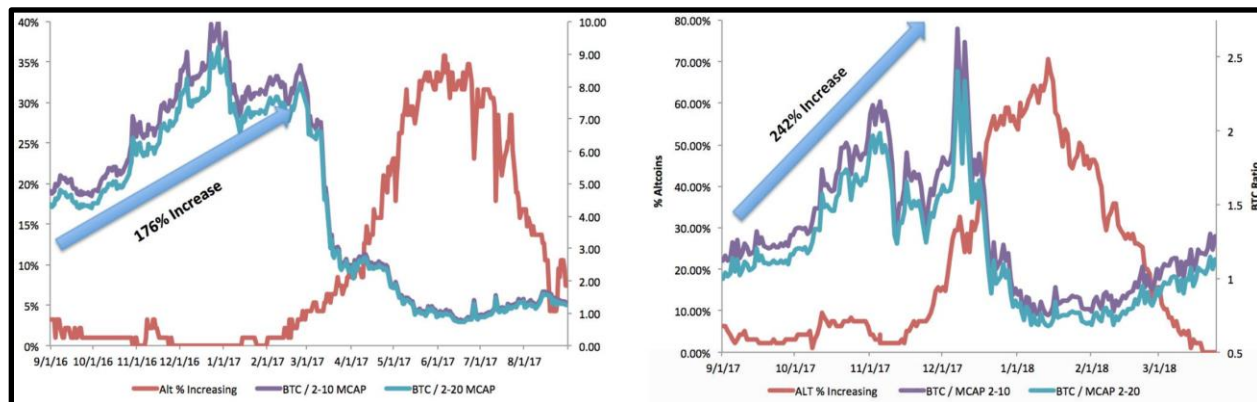


Source: [coinmarketcap.com](https://coinmarketcap.com)

The first altcoin rally in early 2016 peaked at 10%, the second in mid-2017 at 30%, and the last in early 2018 at 70%. 70% of altcoins were up over 3x over the last 3 months at the start of the year.

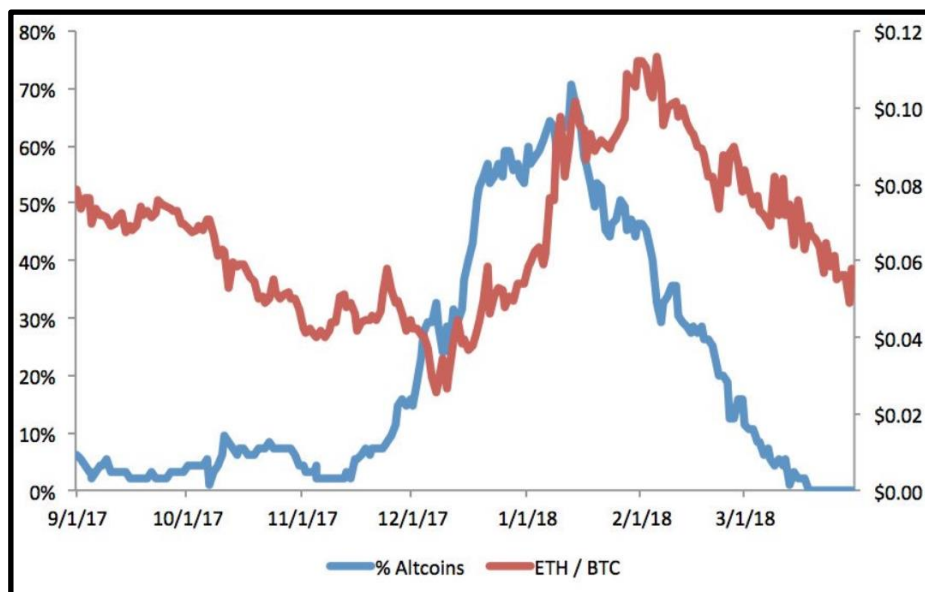
What drives each cycle? Bitcoin, the most liquid fiat on-ramp for altcoin investment.

As each cycle begins, BTC rallies while altcoins have remained flat or dropped. Then, after BTC has made large gains, the new BTC wealth moves into altcoins (deeper into risk):



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

Before altcoins can go on a major rally, wealth first needs to be made in BTC. ETH, the current leading altcoin, is no exception to the pattern. In the latest cycle, ETH/BTC fell greater than 50% as BTC rallied to highs:

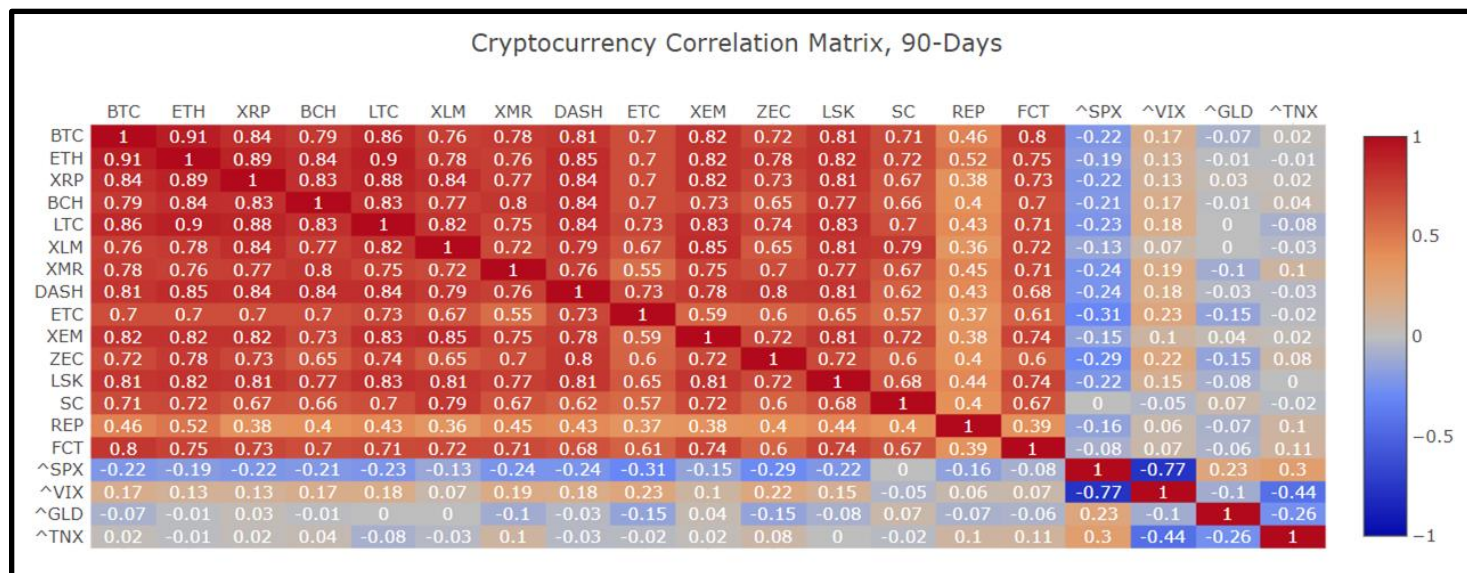


Source: [coinmarketcap.com](https://coinmarketcap.com)

The last three market cycles have clearly shown that altcoins, including ETH, can only rally if BTC leads.

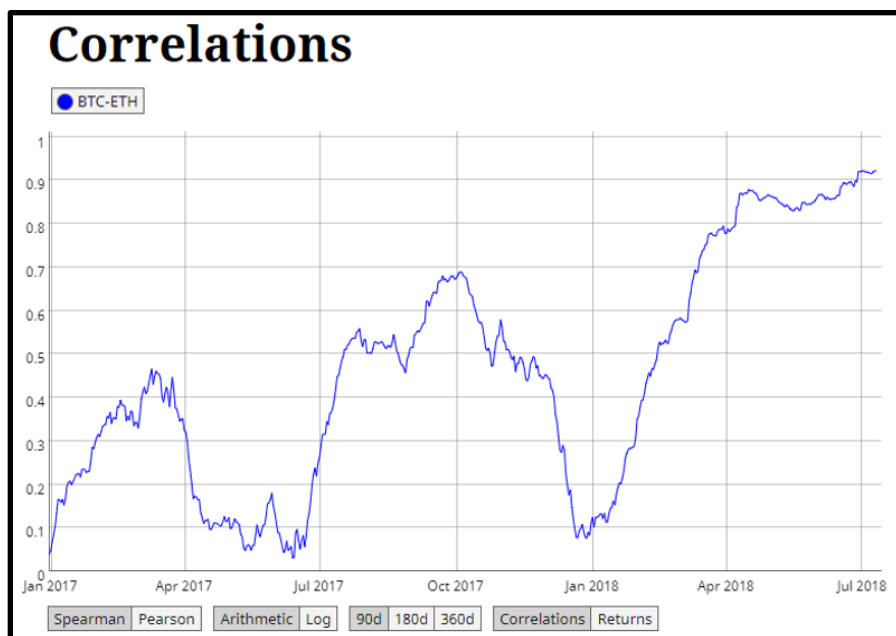


Currently correlations between BTC and ETH have tightened to >0.9.



Source: [sifrddata.com/cryptocurrency-correlation-matrix](http://sifrddata.com/cryptocurrency-correlation-matrix), 7/13/18

The best trades throughout history have been getting on the winning side of a vicious decoupling event. It is when the well-documented, heavily-relied-upon correlations of the past break down that a new investing paradigm is ushered in and takes hold.



Source: [coinmetrics.io/correlations/#assets=btc-eth](http://coinmetrics.io/correlations/#assets=btc-eth)

\* \* \*

Ethereum's current state and a reasonable expectation of near-term development fall short of justifying its highly rich valuation from a probabilistic standpoint. We believe the list of upcoming catalysts will spur material downward ETH price pressure. The short-term catalysts buttress our long-term fundamental thesis that ETH is substantially overvalued and misunderstood by the broader market.

Our short position aims to capture both the market's re-evaluation of Ethereum and hedge the downside of our core long position in BTC.