MONOPOLIES WITH GROWTH: ETHEREUM

Investing for shared value creation

Vineyard Holdings

This deck is intended to accompany the [long-form article](). It is incomplete as a stand-alone.

VINEYARD HOLDINGS

EXECUTIVE SUMMARY

Thesis

- **Long term:** sustainable growth, huge TAM, superior products, scale economics shared, underappreciated due to complexity, and mispriced as a "young bitcoin".

- **Short term:** Upcoming gross supply/demand mismatch given structural outflows of supply enforced by the London fork (EIP1559) and the phased Ethereum2.0 rollout. Short term (18 months) upside on flows alone.

Big questions

- Can it scale to facilitate many, frequent, complex transactions?
  - *Yes, Eth2.0 plus rollups cuts gas fees to viable levels where cost/$tx outcompetes payment processors and computation cost/byte will compete around 2022 with software and infrastructure providers when a premium is afforded to verification. Transaction size, latency, and frequency outcompetes existing payment players.*

- Will it be better than existing alternatives (blockchain and not)?
  - *Yes, blockchain P2P is a superior model with a lower cost base, better security, better ecosystem incentives, equivalent or better transactability, and its interoperability enables more innovation across a wider TAM.*

Key risks

- London/Eth2.0 forks do not get passed.
- Short-term sell pressure forces downward volatility, liquidating existing players and preventing narrative adoption.
- Regulators cripple fiat onramp chokepoints.
- Strong competition from other Layer 1's.

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Ethereum is (somewhat like):

A high-quality "company"...

With a win-win ecosystem...

Which is at a pessimistic valuation...

Is deeply resilient...

And carries sizeable optionality.

It also presents:

A special situation...

In the form of upcoming upside volatility...

Caused by structural supply/demand flows.

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THE PITCH

A high-quality "company"...

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A special situation...

In the form of upcoming upside volatility...

Caused by structural supply/demand flows.

A passionate team of developers attracting worldwide talent.
Management

Platform unit economics with hyper lean cost structure.
Economics

Dominant incumbent with scale advantage over competitors.
Moat

Seven year track record of innovation & adaptability.
Adaptability

Combined optionality and dominance in DeFi, NFTs, dApps & web3.
Optionality

Superior product to traditional finance on cost and functionality.
Differentiation

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THE PITCH

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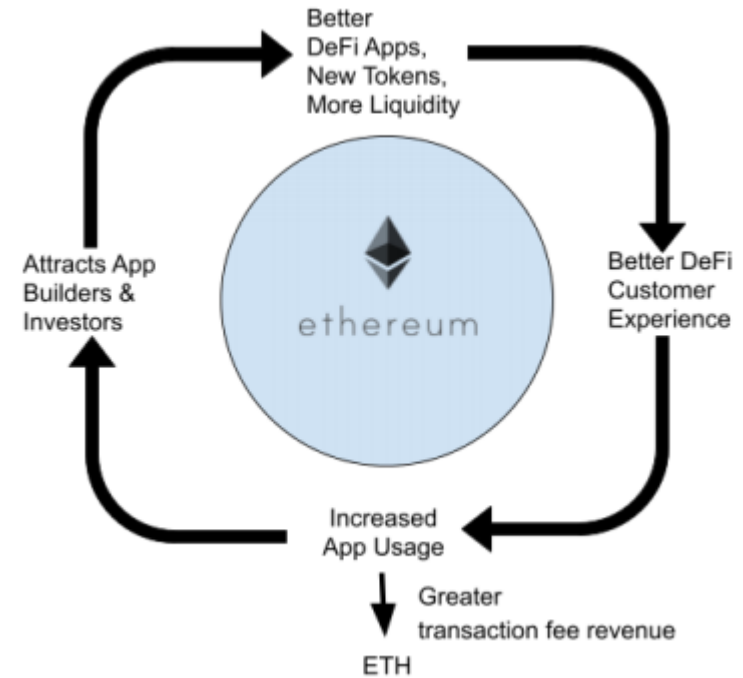
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Scale economics shared.

Better DeFi Apps, New Tokens, More Liquidity

Attracts App Builders & Investors

ethereum

Better DeFi Customer Experience

Increased App Usage

Greater transaction fee revenue

ETH

"...like AWS, but you pay and get paid in Amazon stock for using it ."

Operating cost/income ratio ~20x lower than traditional banks.

Users & developers accrue value like shareholders, thus better incentivized.

Lower legacy costs means more savings passed to the end users.

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THE PITCH

A high-quality "company"...

➤ *With a win-win ecosystem...*

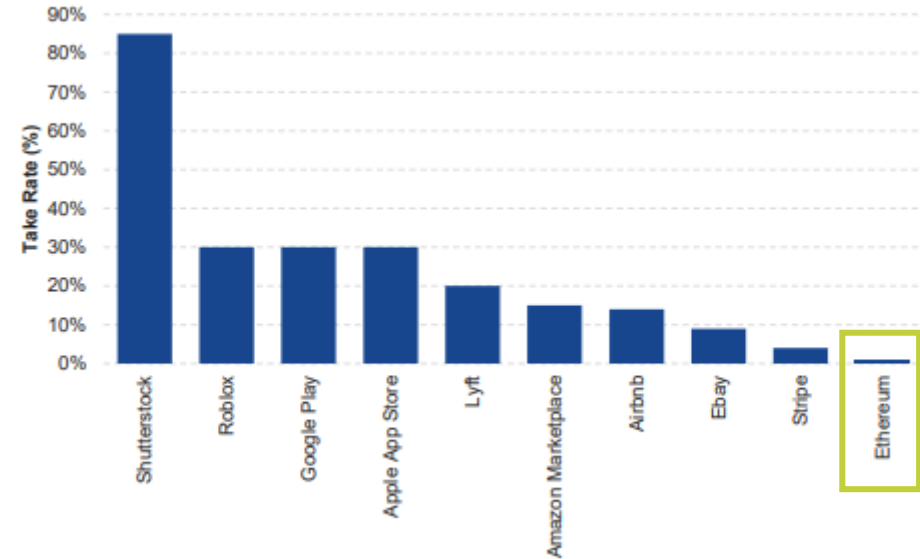*Which is at a pessimistic valuation...*

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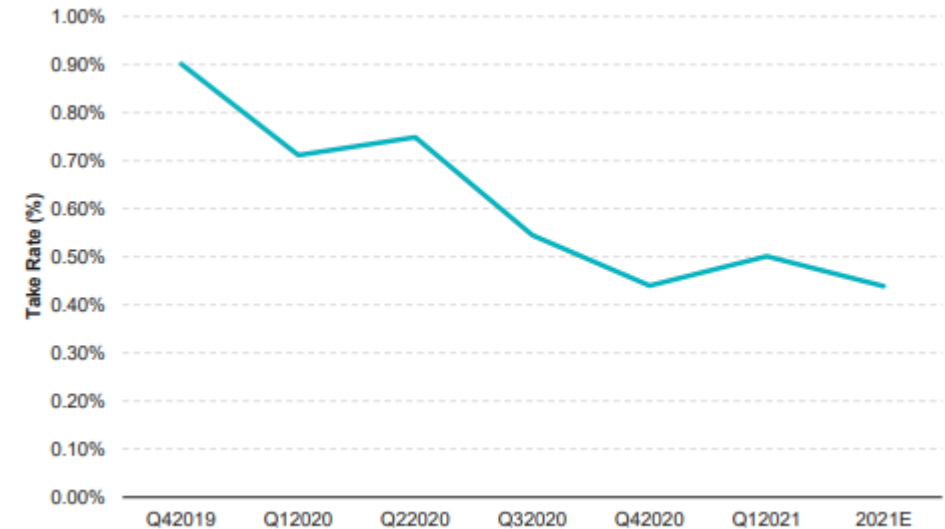
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Internet company take rates

Ethereum network take rate

Sources: VanEck 2021 Ethereum presentation, The Block, Coinmetrics, Bloomberg, VanEck calculations. Data as of 5/31/2021.

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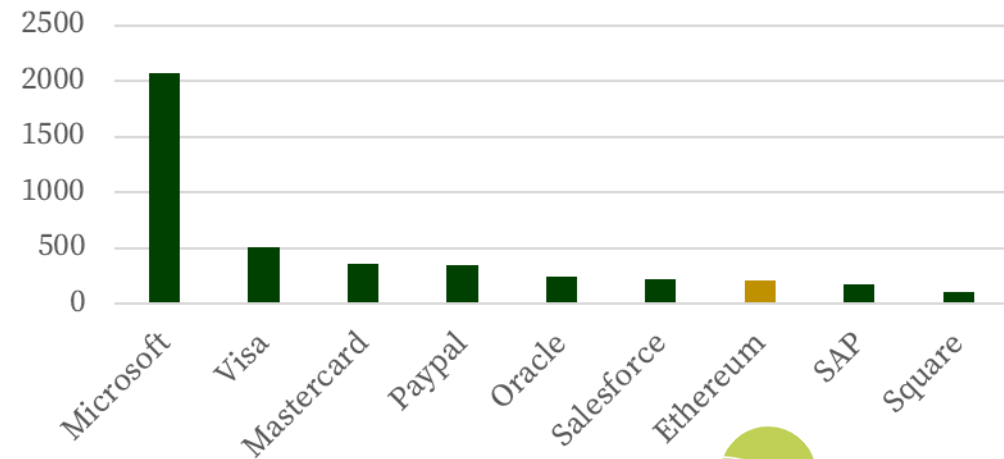
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Hypergrowth (Platform)

Metric	Q1'20	Q1'21	Y/Y
Transaction Volume ($B)	$33	$713	2,065%
Transaction Fees ($M)	$8	$1,699	20,158%
Median Transaction Fee	$0.06	$7.63	12,617%
Daily Active Addresses (k)	354	607	71%
ETH Staked (million ETH)	0	3.6	–
DEX Vol ($B)	$2.3	$177.0	7,596%
DeFi TLV ($B)	$0.8	$52	6,400%
Stablecoin Volume ($B)	$7.1	$41.9	488%
Wrapped Bitcion (btc)	1,777	170,024	9,468%
NFT Art Sales ($M)	$0.7	$396	56,163%
ETH Supply (M)	110.3	115.3	5%

Software & Payments peer market caps ($'bn)

Sources: James Wang.

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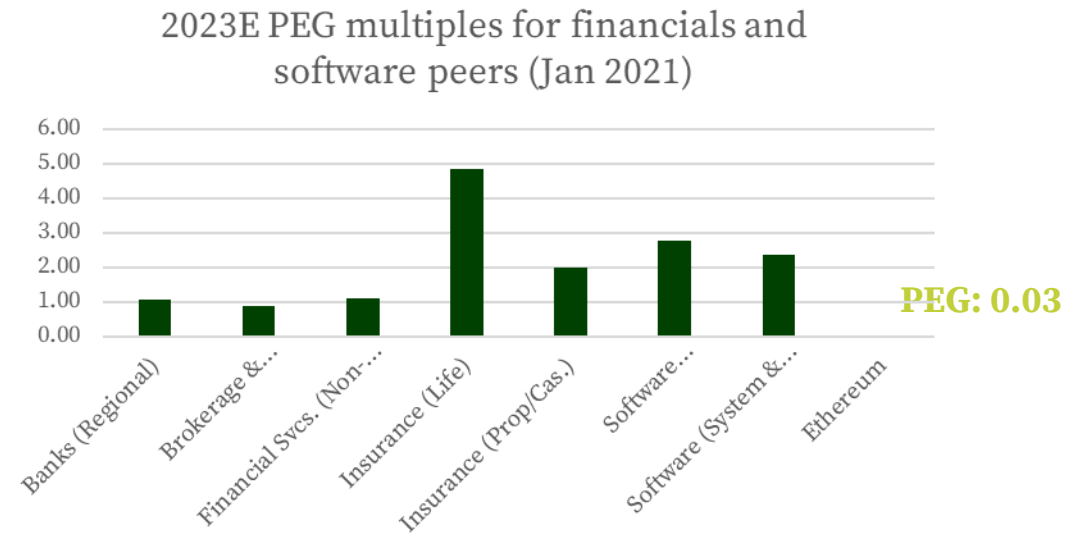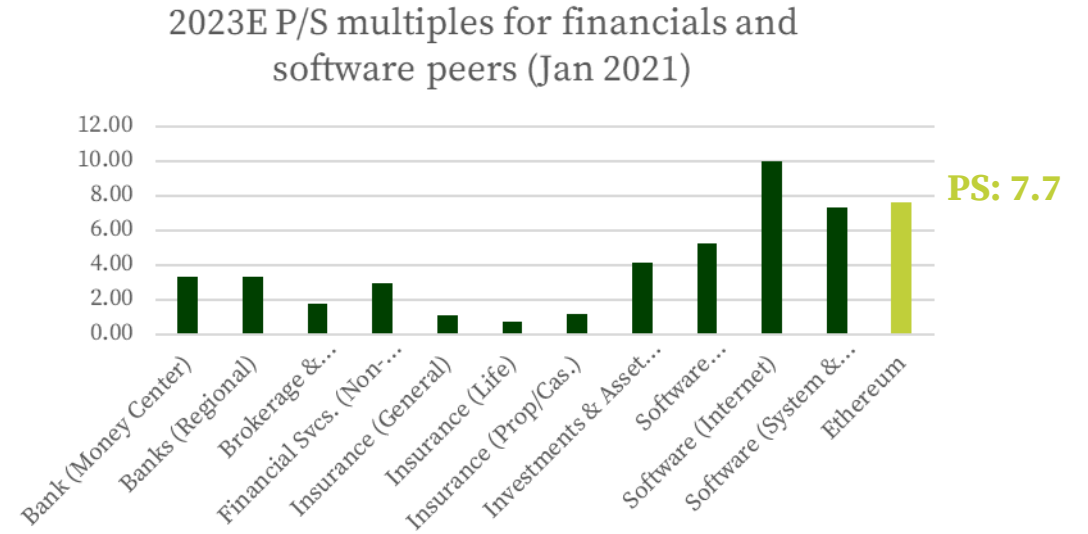➡ *Which is at a pessimistic valuation...*

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2023E P/S multiples for financials and software peers (Jan 2021)

PS: 7.7

2023E PEG multiples for financials and software peers (Jan 2021)

PEG: 0.03

Sources: company financials, NYU Damodaran valuations, January 2021, Grayscale.
Assumes: Eth2 and EIP1559 in existence. 99% net margins and 150% 2Y Sales CAGR for Ethereum ecosystem.

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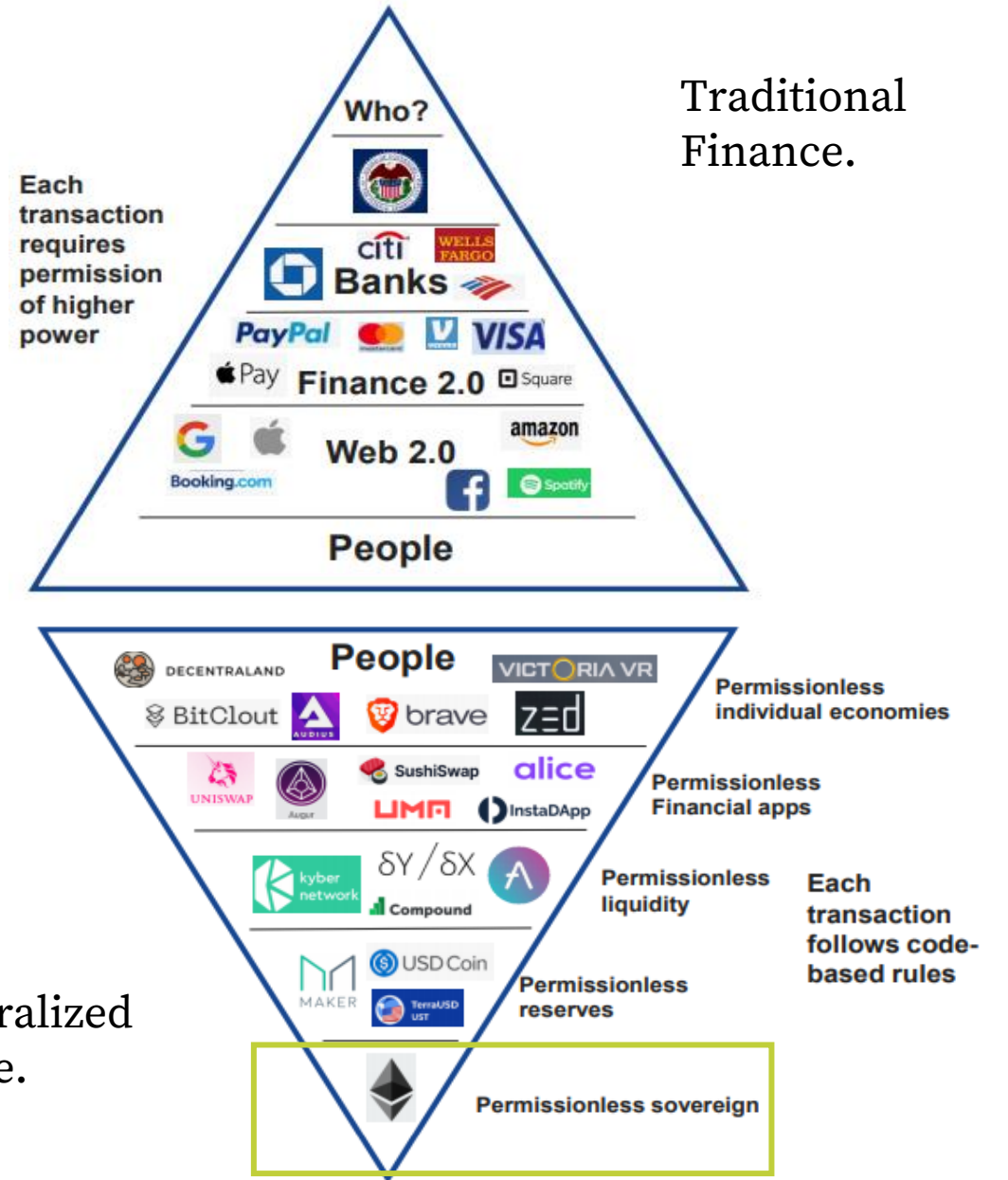
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Traditional Finance.

Decentralized Finance.

Sources: VanEck 2021 Ethereum presentation.

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As a platform
- Network effects (both in users and in developers)
- Ethereum Virtual Machine provides best-in-class developer experience.
- More easily and reliably monetizable than peers (it's Lindy).
- Aligns incentives better than traditional software. Both users and developers – who hold ETH – benefit from appreciation.
- Roughly 80% of all dApps/NFTs/DeFi is built on Ethereum.
- Layer 2 scaling will lower gas to a peer-competitive level.

As an asset
- The more ETH is worth, the costlier it is to attack.
- Has more stable decentralisation than Bitcoin.
- Far more decentralized than closest Turing complete competitor.
- Built in deflationary supply.
- Causal link between ecosystem growth and token appreciation.

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Sources: Nikhil Shamapant – Ethereum, the Triple Halving.

THE PITCH

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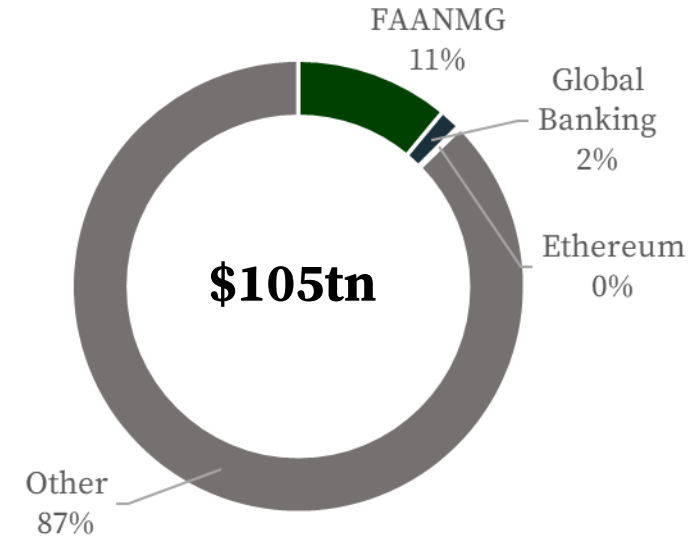*Which is at a pessimistic valuation...*

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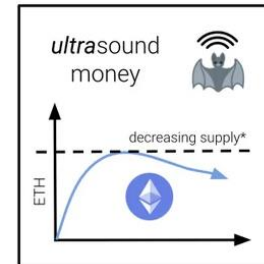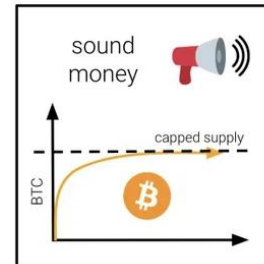
Caused by structural supply/demand flows.

Global Financial Assets

FAANMG 11%

Global Banking 2%

Ethereum 0%

$105tn

Other 87%

ETH Locked in DeFi

TVL (USD) | ETH | BTC   All | 1 Year | 90 Day | 30 Day

15.0M
12.5M
10.0M
7.5M
5.0M
2.5M
0

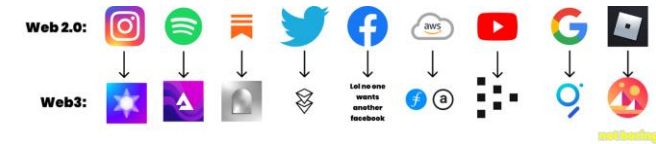Oct 2017   Jul 2018   Apr 2019   Jan 2020   Oct 2020   Jul 2021

DEFI PULSE

DeFi

"This NFT world is likely the greatest unlock of artist opportunity in 100+ years. This isn't a suboptimal or fringe version of the real-world art economy, it is a vastly improved one."

— Scott Belsky,
Chief Product Officer at Adobe, Founder of Behance, Venture Partner at Benchmark

NFTs

sound money — capped supply

BTC

ultrasound money — decreasing supply*

ETH

*if fee burn (EIP 1559) greater than inflation

Money

Web 2.0:

Web3:

Lol no one wants another facebook

Web3.0 dApps and DAOs

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Ethereum 1.0

(As-Is)

August 2021

EIP1559 - split transaction fees on Ethereum into base fees and tips, while burning used fees to curb ETH inflation.

December 2021

Proof of Stake (PoS) merge enables staking and decreases energy cost.

2022

Shard chains improve transaction capacity and data processing.

Ethereum 2.0

(To-Be)

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Sources: Finematics, Justin Drake, Nikhil Shamapant

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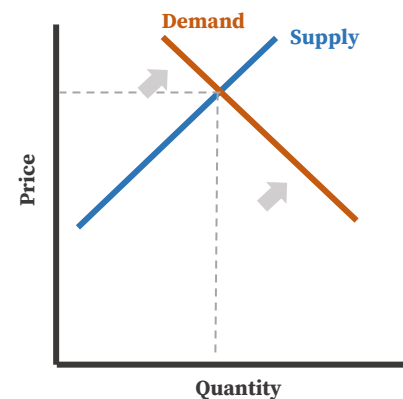
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In the form of upcoming upside volatility...

Caused by structural supply/demand flows.

As-Is

- Miners verify via Proof of Work (PoW).
- Paid in ETH.
- Sell ETH to recoup energy cost.
- ETH supply is inflationary.
- Current daily sell pressure: 22.3K ETH.

To-Be

- HODLers verify by putting ETH at stake.
- Staking yields ETH at ~25% APY.
- No mining sell pressure + increased HODL + deflationary supply.
- Est. daily sell pressure = 2.6K ETH.

Sources: Finematics, Justin Drake, Nikhil Shamapant

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THE PITCH

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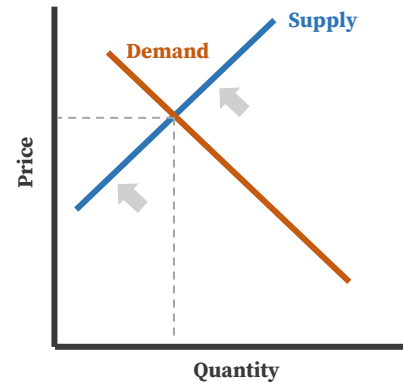*Which is at a pessimistic valuation...*
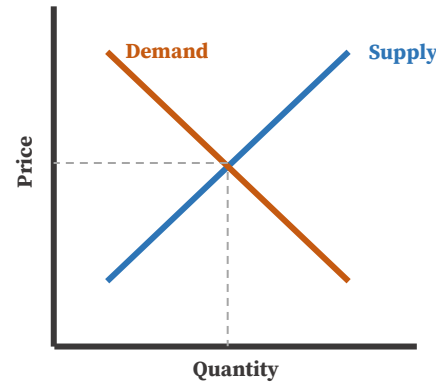
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Caused by structural supply/demand flows.

- PoS = Less sell pressure, more HODL incentive.

- EIP1559 = Deflationary supply.

- PoS + EIP1559 = Float Shrink.

- HODLers/stakers are a price insensitive supply outflow.

- A % of retail is inversely price sensitive = price leads narrative adoption (reflexivity).

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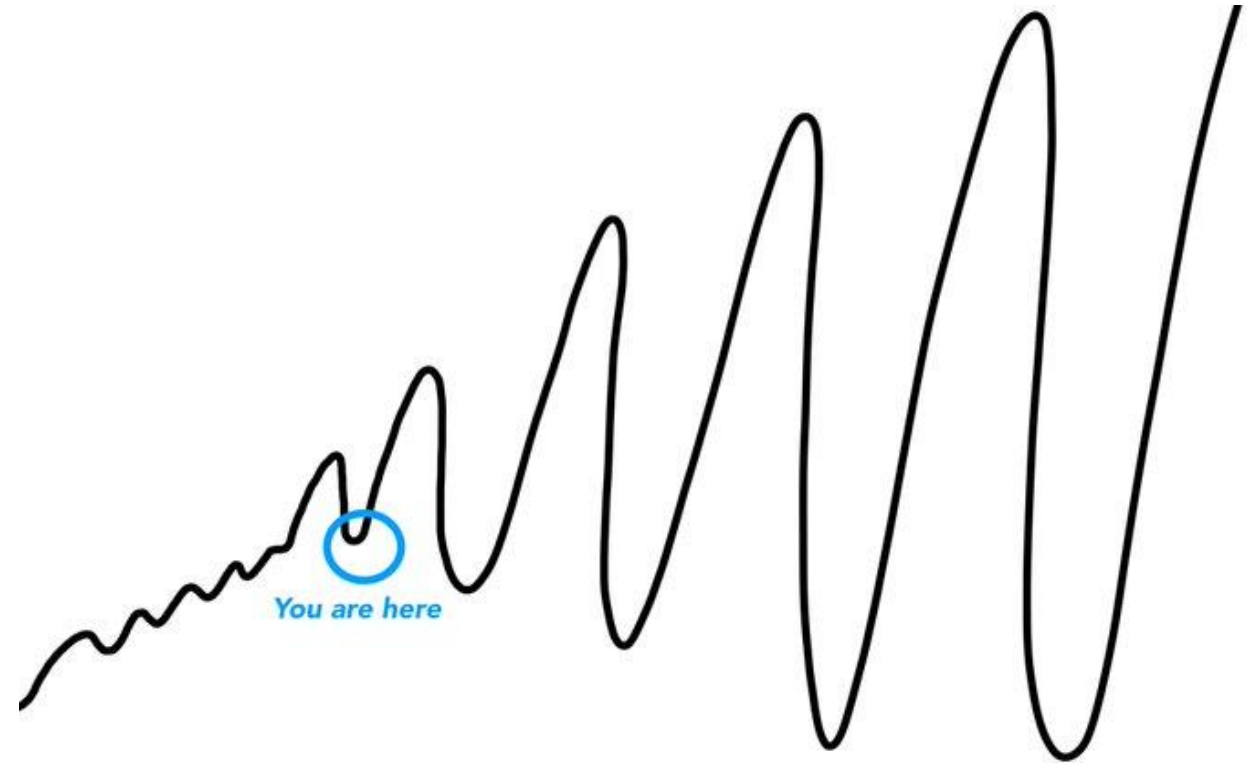
Is deeply resilient...

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A special situation...

→ *In the form of upcoming upside volatility...*

Caused by structural supply/demand flows.

The result? Volatility central.

You are here

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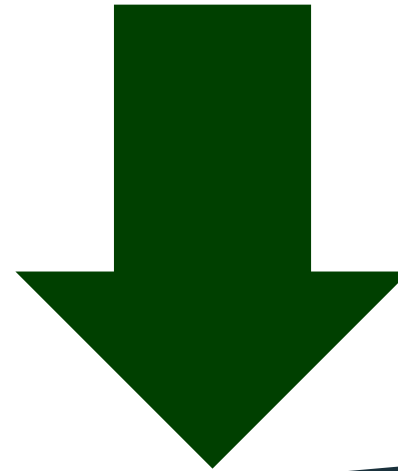
In the form of upcoming upside volatility...

Caused by structural supply/demand flows.

As-Is

Supply:

ETH staked/locked in DeFi = 12%
Miners sell ETH to recoup PoW costs.
Inflationary issuance.

"Float"

Demand:

Retail adoption.
Narrative remains unknown by popular media.
Priced according to Bitcoin.

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Sources: Nikhil Shamapant – Ethereum, the Triple Halving.

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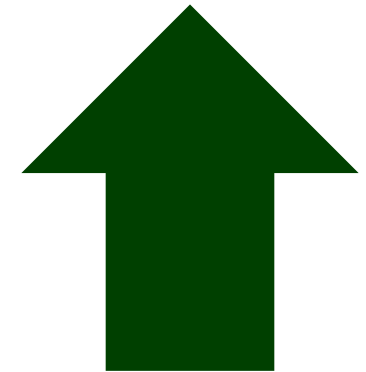
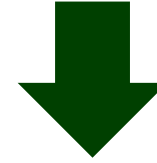*Caused by structural supply/demand flows.*

To-Be

Supply:

ETH staked/locked in DeFi >30%

Selling pressure reduced ~90%.

Deflationary gas burn.

High DeFi yields (25%+ incentivize liquidity providing).
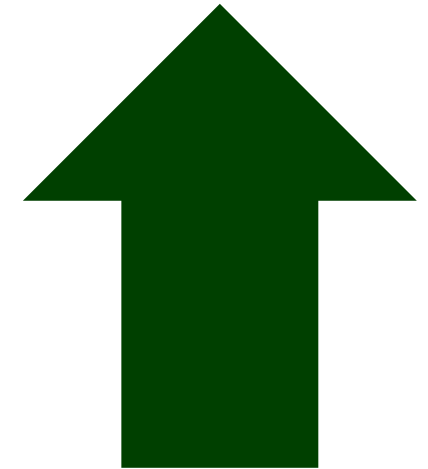
"Float"

Demand:

Demand inelasticity from passive inflows via upcoming ETFs.

Price leads retail narrative adoption of "internet money"+ staking yields.

More retail onramps (Visa, PayPal).

Institutions already familiar with BTC.

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Sources: Nikhil Shamapant – Ethereum, the Triple Halving.

Buying ETH in the next 18 months is a special situation.

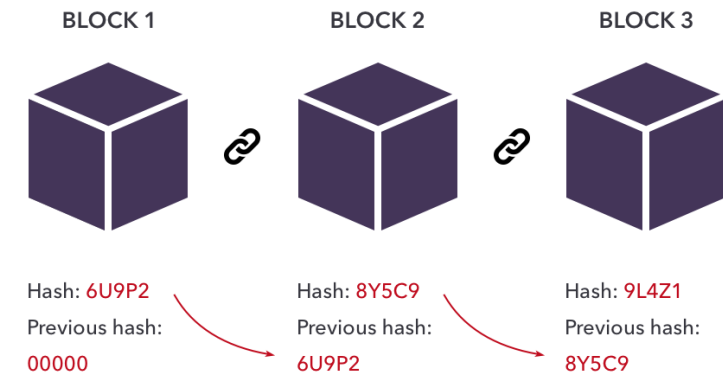*Staking ETH for the long term is a quality asset at a pessimistic valuation.*

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What is decentralized computing?

A computer application, which **creates some useful result** for its users, can be **run simultaneously on many computers** around the world rather than on just one central server, and the **network of computers can work together** to run the application in a way that **avoids trusting** the honesty or integrity of any one computer or its administrators.

Bitcoin was the 1st, using three core innovations:

1. **Peer-to-peer networking** – nothing new.

2. **Blockchains** – novel ways of storing/validating data.

3. **Consensus mechanisms** – the process by which networked computers agree on and record changes to a shared set of data.

BitTorrent™

BLOCK 1   BLOCK 2   BLOCK 3

Hash: 6U9P2   Hash: 8Y5C9   Hash: 9L4Z1
Previous hash: Previous hash: Previous hash:
00000   6U9P2   8Y5C9

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What does decentralized computing solve?

1. **"Internet Money"** – Current value transfer protocols require trusting 3rd party authentication and incur unnecessary fees.

2. **Identity verification (individuals and objects)** – The Internet lacks a native, community-owned layer for storing/changing identity data.

Current use cases?

1. Finance.

$$\delta Y/\delta X$$

2. Digital goods.

Frontier use cases?

1. Organization structuring.

2. Internet of Things.

3. Permissionless app interoperability.

4. New business models.

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Sources: Peter Van Valkenburgh, Coincentre
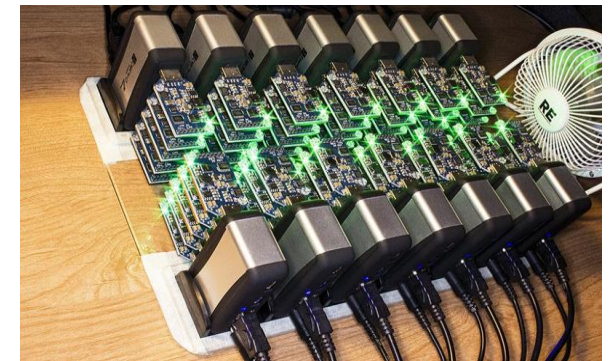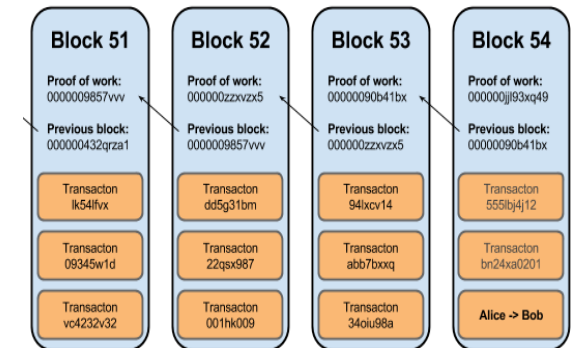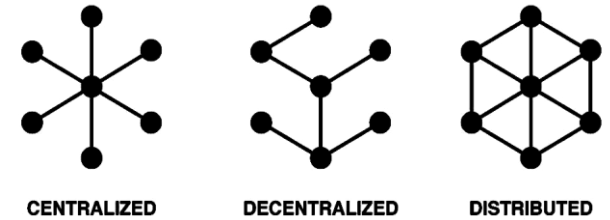
What is Bitcoin?

Bitcoin is:

- A peer-to-peer decentralized payment system.

- Trustless transactions recorded in a publicly distributed, open-source ledger.

- Based on PoW (Proof of Work) – mining.
    - CPU -> GPU -> ASIC
    - Mining pools

Bitcoin relies on:

- A large network of users.

- Miners consuming large amounts of energy.

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Why Bitcoin?

"Show me the incentive and I'll show you the outcome" – Charlie Munger.

Ideologically Bitcoiners believe:

- FED/Fiat = A bad monetary policy
  Bitcoin = Internet age "gold standard"

- Libertarian/Austrian economics (e.g., Mises, Rothbard, and Spitznagel).

- Decentralization enables politically neutral individual sovereignty, which is a worthwhile pursuit.

The Bitcoin advantage:

- Bitcoin's simplicity makes it excellent at storing and transferring value, and little else. The base layer is minimal by design, having lower barriers to access running a node and rather scaling through layer 2's like the Lightening Network.

- Bitcoin's path dependency, security, decentralization and its Lindy-ness as a cryptocurrency make it the best (and only, if you're a maximalist) option among cryptocurrencies.

- Most accepted cryptocurrency (Amazon/Tesla/PayPal etc.).

	Bitcoin	Gold	Fiat
Durable	B	A+	C
Portable	A+	D	B
Fungible	B	A	B
Verifiable	A+	B	B
Divisible	A+	C	B
Scarce	A+	A	F
Established History	D	A+	C

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Sources: Allen Farrington, Er'el Granot, Ariel University, Lyn Alden

What is Ethereum?

Like Bitcoin, Ethereum is an open-source blockchain software protocol that enables instant, permissionless 365/24/7 global value transfer.

Ethereum is also:

- The world's computer; a global, open-source computing platform for developers to build decentralized applications.

- Ownership stake in code-based Ethereum economy ($330b market cap).
  - This economy exists to provide digital scarcity for any digital asset.

- Internet money (write code that controls digital value).

- A "triple-point" asset, acting as a yielding asset (like equities), a store of value (gold), and a consumable (oil).
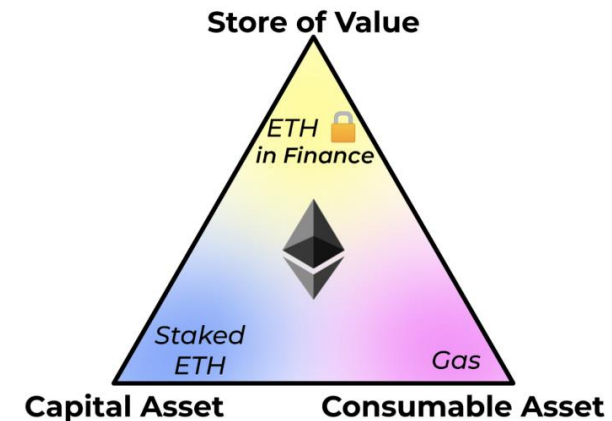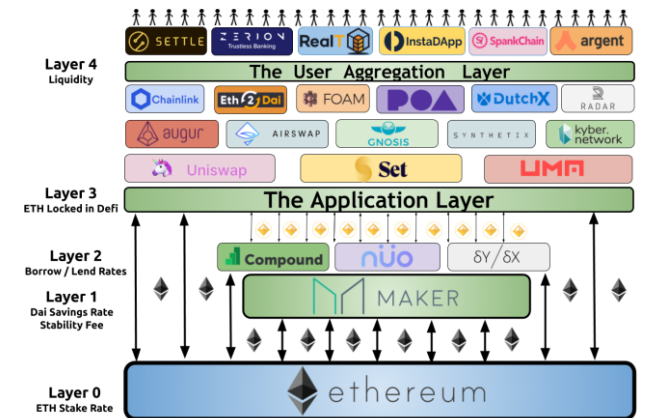
Sources: VanEck 2021 Ethereum presentation, David Hoffman, Chegg

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What is Ethereum (continued)?

A couple flawed-but-useful analogies for Ethereum:

- A bunch of distributed, online vending machines
- Digital oil
- Communally-owned AWS
- The "Microsoft Excel" of the blockchain world (thanks Packy)
- The TCP/IP of Web3.0
- Like contract law and property law found a Bloomberg terminal.
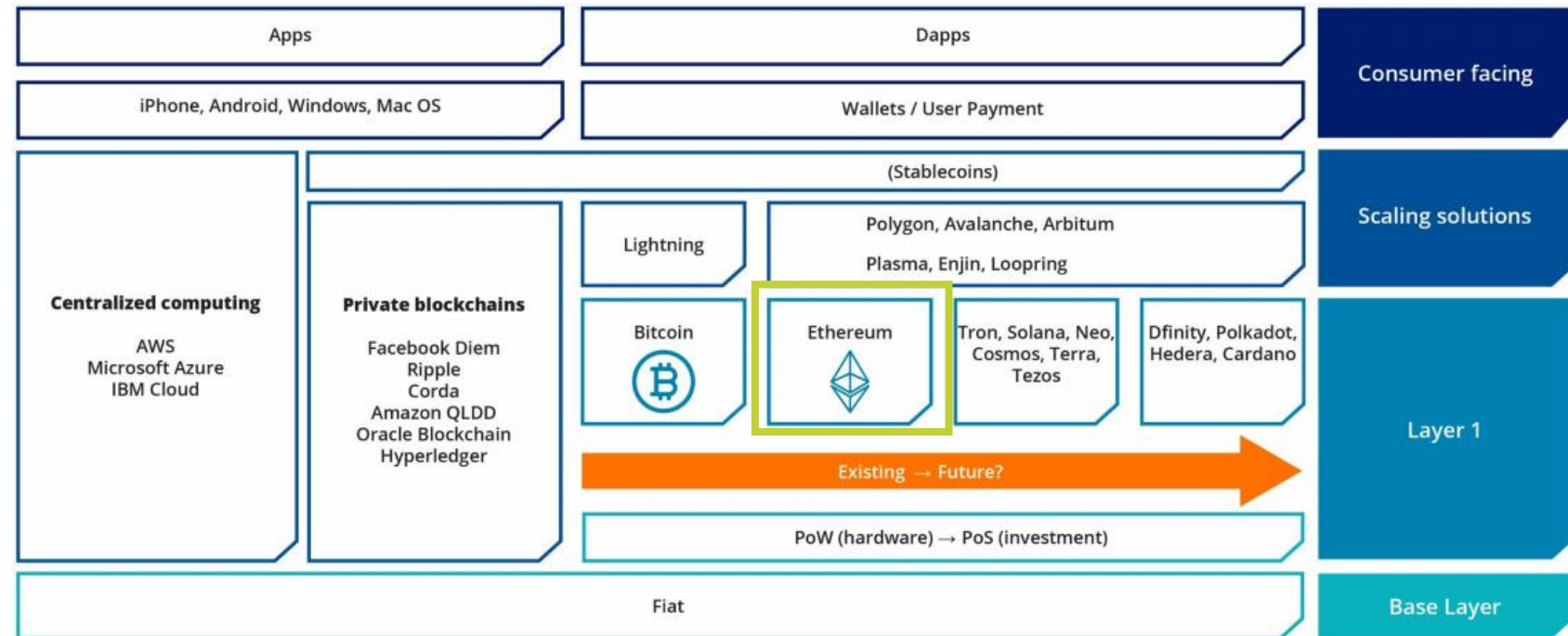
Sources: VanEck 2021 Ethereum presentation, David Hoffman, Chegg, Packy McCormick

How does Ethereum work?

Smart contracts are auto-executing and immutable agreements that underpin the Ethereum ecosystem.

Developers code smart contracts using Ethereum's programming language and upload them to the Ethereum system (Ethereum Virtual Machine).

Every node gets a copy of that code.

When users transact using those contracts, all nodes must verify the outcome per contract rules. This verification is the computation blockchain relies on.

Each miner/staker is continually validating blocks of transactions. Valid blocks are added to the chain, which is the history (and current state) of all transactions and smart contracts.

To stop people from overclocking the compute systems, users must pay gas fees as computational credit. Gas is purchased using Ether.

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Why Ethereum?

"If crypto succeeds, it is not because it empowers better people. It's because it empowers better institutions."
– Vitalik Buterin, creator of Ethereum.

- **Programable code**
  - Enabling decentralized smart contracts (DeFi, DAOs, NFTs, dApps, etc.).
  - Enables interoperability and modular building.
  - Network effects.

- **"Ultra-sound" money**
  - Deflationary supply.
  - Secures ecosystem at larger scale.

- **Transactions are faster** and cheaper than Bitcoin, and more secure and decentralized than alternatives.

- **More energy efficient.**

- Platforms are an **increasing return to scale** environment and Ethereum is the most scaled (~80% market dominance).

- **Widest variety** of applications - including multiple central banks.

- To the extent the scale advantage **keeps costs lower** and **makes development easier** than the competition, switching would be unattractive.

Diverse use case for smart contracts /
# of unique wallets interacting with smart contracts by use case

Legend:
- Games
- Defi
- Gambling
- Exchanges
- Other
- Social
- Collectibles
- Marketplaces
- High risk
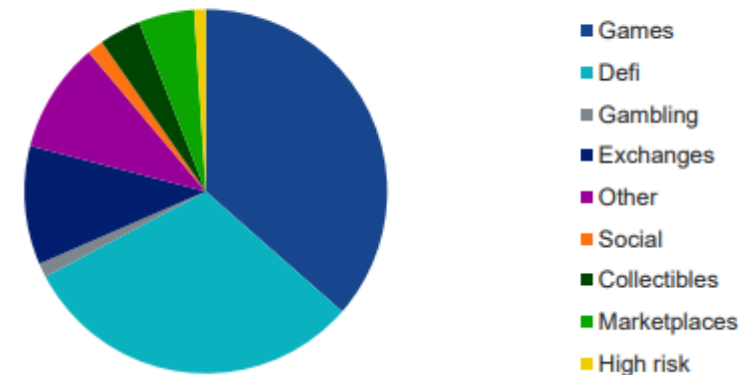
Ethereum 2.0 greatly reduces energy consumption compared to its predecessor and various other countries
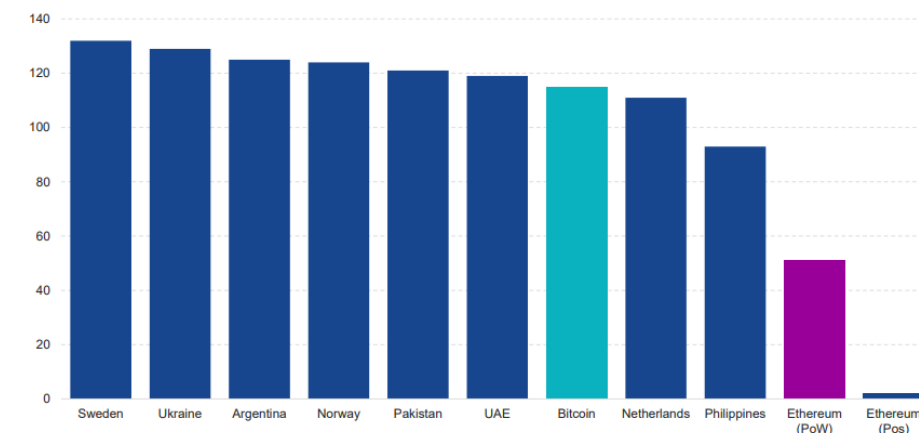
Bar chart categories: Sweden, Ukraine, Argentina, Norway, Pakistan, UAE, Bitcoin, Netherlands, Philippines, Ethereum (PoW), Ethereum (PoS)

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Sources: VanEck 2021 Ethereum presentation, Eli Dourado

Ethereum's network

"In order to have a decentralized database, you need to have security. In order to have security, you need to have incentives." – Vitalik Buterin.

- **Aligns incentives better than traditional software.**
  - Users and developers own ETH.
  - The more ETH is used as gas, the more the token appreciates.

- **The more ETH is worth, the harder the network is to attack.**
  - A cornerstone of dApps is their decentralization and security.
  - For developers to ensure security, they are incentivized to sustain a higher ETH price.

- Practically, no dev thinks "let me HODL ETH so my project is secure". Instead, they think "let me encourage people to look into building dApps on Ethereum so the ecosystem grows".

- Hence, **narrative reflexivity is so important for crypto**.
  - ETH's price increasing *"shifts some of the burden of security from builders to investors, heightens the wall, makes the network more secure, increases the attractiveness of building on Ethereum, which makes ETH more valuable, heightens the wall further, and so on."* – Packy McCormick, notboring.co

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Sources: Packy McCormick, Notboring.co, David Hoffman

Ethereum's network

Transaction cost and usage
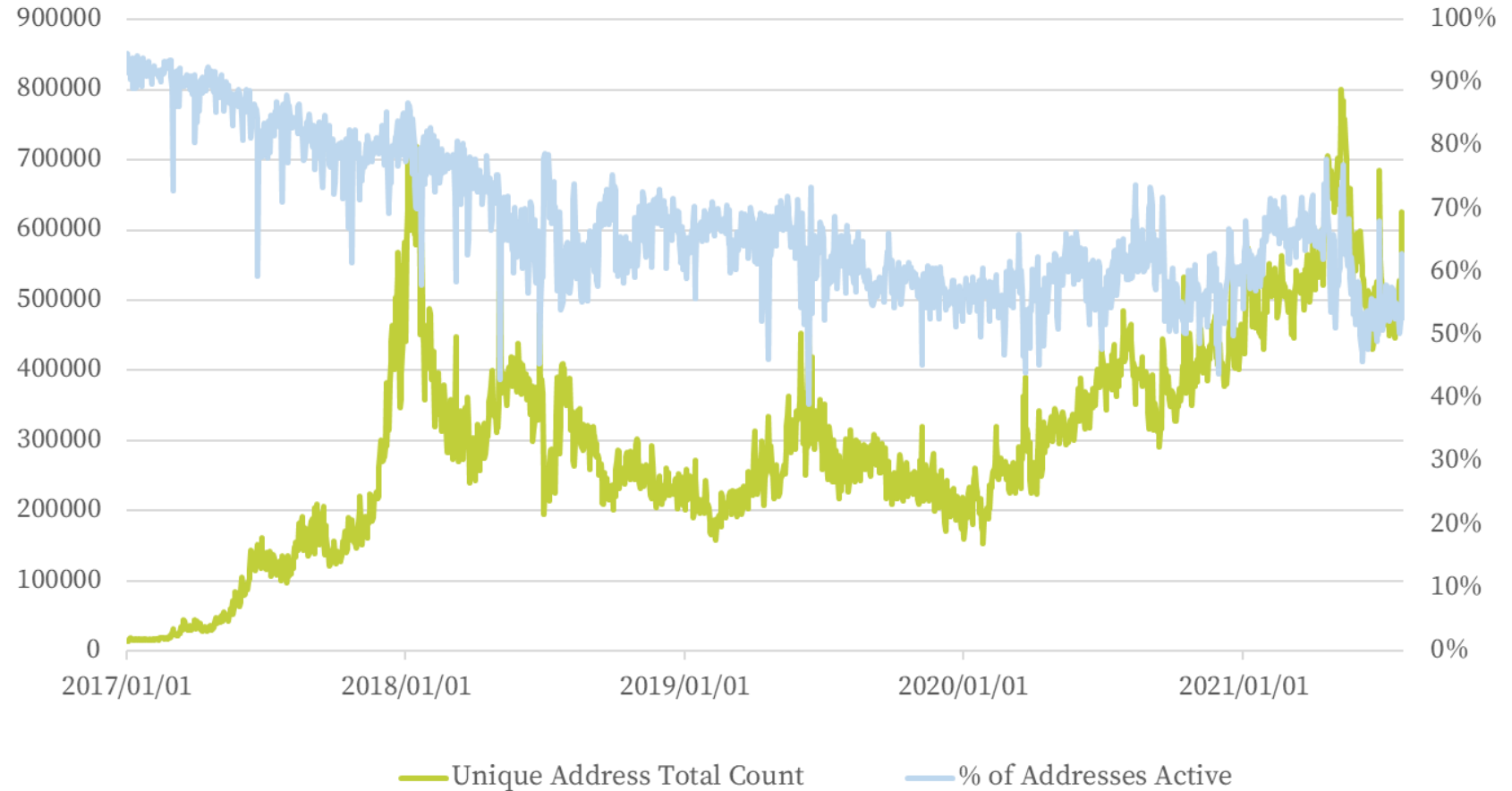
Legend: Unique Address Total Count — % of Addresses Active

Sources: Etherscan.io

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Ethereum's monetary policy

Current

- Supply is ~115 million Ether, with a ~0.2% inflation/issuance rate.
- Issued Ether + gas fees go to proof-of-work miners, who sell ~70% to cover energy costs.
- Ethereum has changed monetary policy ~10 times historically.
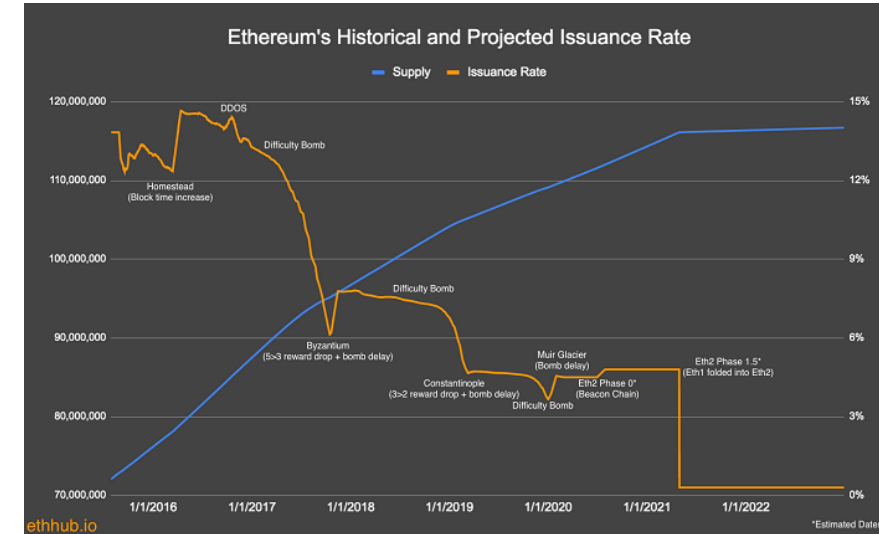
Post London fork (EIP1559)

- Both inflationary (new issuances for validators) and deflationary (base gas fees will be "burned", decreasing supply).
- Users can still pay "tip fees" so validators prioritize their transactions. These fees will accrue to the validators.
- Issuance rate will be determined by Staked Ether/Total Ether, incentivizing the added security where needed with higher staking yields (issuance rates).
- Deflationary burn will increase as total fees increase.
- **Theoretically, the net effect will be a rules-based, majority deflationary, throughput-enhancing policy.**

"Ultrasound money"

Sources: EthHub, Lyn Alden

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Call options in Ethereum

"Long-term thinking is both a requirement and an outcome of true ownership." – Jeff Bezos, 2003.

- **The price of crypto is largely speculation driven.**
  - Present real world use cases where crypto is better than alternatives are few.

- **The bulk of present valuation comes from "call options"** on future use cases.
  - Decentralized Finance (**DeFi**),
  - Non-Fungible Tokens (**NFTs**),
  - Decentralized Autonomous Organizations (**DAOs**).
  - Decentralized Applications (**dApps**)

- Unlike foundational/scaffolding layers in previous innovations (e.g., GPS -> Google Maps), **with Ethereum, the value of all use cases accrues to the platform.**

FIGURE 2

Three tiers of IT infrastructure and building the Spatial Web

As the technologies and capabilities that compose and connect IT architecture converge, the Spatial Web will mature. The figure below shows how key enabling technologies drive their respective computing eras.

Architectural layer	Web 1.0 (1990s–2000s)*	Web 2.0 (2010s–2020s)*	Web 3.0 / Spatial Web (2020s and beyond)*
Interaction	Desktop browser (click and type)	Mobile touch-screen (touch and swipe)	Wearable AR/VR, voice, and IoT devices (show and tell)
Computation	Situated server (via wire)	Cloud computing (via 3–4G)	Distributed computing (via AI, 5G + Edge)
Information	Structured (SQL)	Unstructured (big data)	Distributed ledger technology (blockchain)

*Note: Date ranges are approximate and meant for directional purposes only.
Source: Deloitte analysis adapted from Gabriel René and Dan Mapes, *The Spatial Web: How Web 3.0 Will Connect Humans, Machines, and AI to Transform the World* (Amazon, 2019).

Deloitte Insights | deloitte.com/insights

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Sources: Deloitte, https://twitter.com/JordsNel/status/1323293547391520768

How does the ecosystem value accrue to ETH?

ETH is used for:
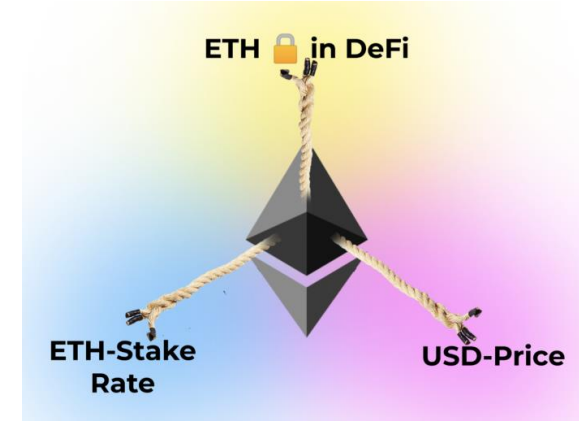- Gas fees
- In DeFi as a reserve asset, as collateral, for financing, and as a medium of exchange
- Paying certain retailers
- Unit of account for digital goods online (NFTs/in-game items)
- Securing the Ethereum network by locking up supply (staking), thus generating yield and becoming a store of value
- Speculation, which drives the crypto-adoption narrative

Why ETH and not another token?
- Using altcoins to pay for Ethereum validation/gas fees is called "economic abstraction")
- Because a proof of stake system is more costly to attack with a higher ETH price (as hostiles would have to put more value at risk), networked actors are incentivized by their need for security to rather transact in ETH.
- If ETH wants to usurp the existing financial system, it must be able to secure trillions of dollars → disallows economic abstraction.

How does ETH number go up?
- Growth in Ethereum ecosystem → more transactions → more demand for gas fees → more demand for ETH.
- Adoption of Ether (or BTC on Ethereum) as money/store of value → more demand for ETH.
- Users stake ETH → less supply.
- Staked ETH generates yield as it's a share of the Ethereum network and a claim to Ethereum's fees → more people buy ETH to stake
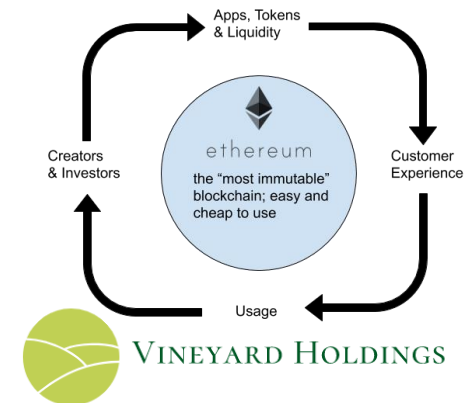
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Sources: Anthony Sassano, David Hoffman

A primer on dApps

"dApps are a growing movement of applications that use Ethereum to disrupt business models or invent new ones." – Ethereum.org

- **dApps are:**
  - A smart contract (running on the blockchain) plus,
  - A user interface (like a web page, or cellphone interface).

- As regular app stores have shown us, **open platforms with a scaled user base provides plenty of room for innovation**.
  - Think Twitter, but with no owners, free from censorship, with built-in payments, one anonymous login, no down time, which can plug and play with other apps, and is backed by cryptography.

- But, for each action a dApp takes on-chain (minting NFTs, transacting, interfacing) it **incurs gas fees.** This means:
  - **Code complexity incurs gas fees exponentially**.
  - Cost/tx is not an accurate comparison between ETH and payment/software companies.
  - Gas cost/tx as a % of tx is low when the transaction is value transfer, but when it's a dApp pulling data or changing an ID, it's costly to do frequently.

Apps   **dApps**
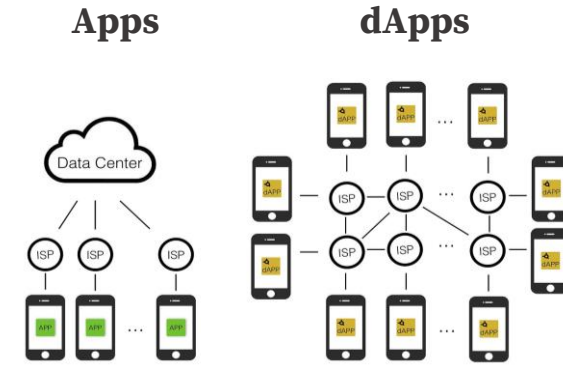
Sectors of dApp economy by active users
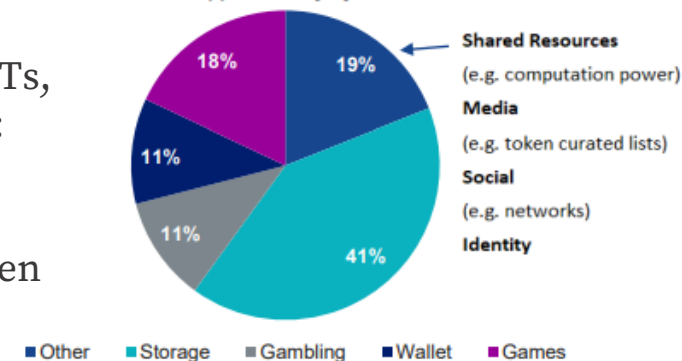
Shared Resources
(e.g. computation power)

Media
(e.g. token curated lists)

Social
(e.g. networks)

Identity

■ Other   ■ Storage   ■ Gambling   ■ Wallet   ■ Games

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Sources: Simon Janin, VanEck 2021 Presentation

Real world applications of dApps

"The Ethereum ecosystem has to expand beyond just making tokens that help with trading tokens." – Vitalik Buterin.

Today:

- **DeFi,** most of which today is traders swapping one token for another on exchanges in circular bouts of zero-sum speculation and inter-currency arbitrage.
  - *By USD volume transacted, DeFi accounts for 99% of ecosystem value.*

- **Games.** Axie Infinity has been a breakthrough in popularity.
  - *On-chain games account for 81% of the total number of transactions made.*

- Digital art. **NFTs** have surged in popularity recently, with many insiders collecting digital art

Tomorrow:

- DeFi may one day allow folk to pay, send remittances, buy and sell things, apply for loans and mortgages, crowdfund startups, and **everything the existing financial system does.**
- NFTs can theoretically **bring all certification on-chain**. IDs, title deeds, state documents, multi-game digital goods, IP protection, etc.
- **Security infrastructure**, data storage, supply chain optimization, censorship-resistance, etc.

Current dApp use cases
(by user count)

- Games — 40%
- DeFi — 36%
- Exchanges — 8%
- Marketplaces — 5%
- Other — 5%
- Gambling — 3%
- Collectibles

Trade   *Game*   *Curate*   *Lotto*

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DeFi and Ethereum

- Roughly **80% of DeFi occurs on the Ethereum blockchain** and uses Ethereum as the reserve asset.

- **Locking ETH up as liquidity provision generates yield** (as folk who want to swap ETH for something else must do so through liquidity pools, paying fees which accrue to the liquidity providers).

- **ETH stake rate offers the "risk-free rate" for DeFi/Ethereum.*** The more ETH locked in DeFi, the more the Ethereum protocol recognizes the need for security (via a Value Staked/Total Value function) and increases ETH stake rate. The more ETH locked in DeFi, the better the ETH stake rate.
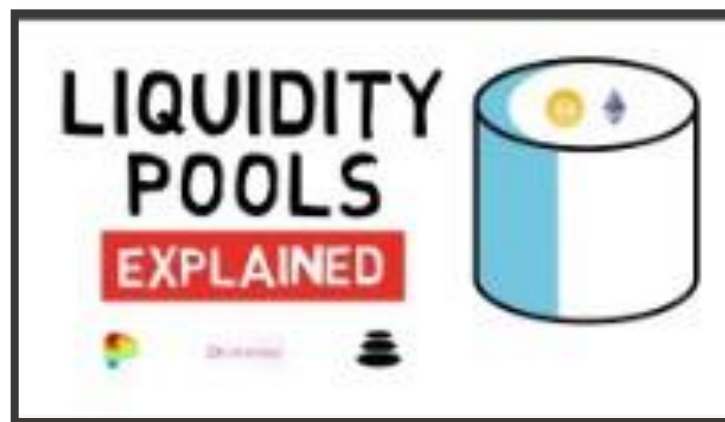
Finematics (YouTube) – <u>Liquidity Pools</u>

Finematics (YouTube) – <u>DeFi Explained</u>

* <u>Alden</u> and <u>Pfeffer</u> have questioned whether Ethereum protocol adoption causes ETH token appreciation. As ETH (protocol and/or asset) are adopted in DeFi, the provision of tokens (LP or ETH) both transacts on-chain (incurring gas fees) and reduces staked ETH (causing the ETH stake-rate to rise). The net effect of this is more demand for ETH (in addition to the fees) in the same way a rising treasury yield attracts investors. If these investors are pulled from DeFi (unlikely, as yields there are better), then the protocol adoption may not cause ETH appreciation. If they are pulled from outside crypto, it's more likely ETH will rise as adoption is then not zero-sum.

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VALUATION

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Sources: David Hoffman, Andrew Wong, Finematics, Lyn Alden, John Pfeffer

Why DeFi?

The theoretical benefits of DeFi as an ecosystem are:
- it's **permissionlessness** – if you follow the rules, you can have access;
- **self-custody and control** disperses the effects of systemic faults (i.e., 2008 crash);
- it's **antifragile** – a feature of decentralization; and it has
- **better incentives alignment** – As developers and users both own underlying platforms, they are likely to improve them. This creates opportunities for new business models and ways of working.

A. Traditional bank
- +1% interest paid to saver
- +7% interest from borrower
- Depositor: +1%
- Bank NIM: +6%
  (pays legacy IT/Ops costs)

B. FinTech lenders
- +1% interest paid to saver
- +4% cost of funds paid to bank / investor
- +7% interest from borrower
- Depositor: +1%
- FinTech fees: 2%
- Bank NIM: +4%
  (pays legacy IT/Ops costs)

C. Open Finance
- ETH
- +4% interest paid to saver
- UNDERWRITER
- +1% fee to underwriter
- Tokenization
- Derivatives
- Asset management
- Lending
- Stablecoins
- Exchange
- Cryptocurrency or stablecoin token
- +5% interest from borrower
- Depositor: +4% *(legacy IT/Ops cost paid to savers)*
- Underwriter Fee: 1%

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Sources: Andrew Wong

Why DeFi?

- **Stablecoins** were "… designed to improve capital and operational efficiency across all digital asset marketplaces and they bring about a number of benefits, including 24/7 money movement capability, payments for goods and services, using a stable store of value, and participation in the burgeoning DeFi space." – Yusuf Hussein. Stablecoins have recently made regulatory headway and are spurring adoption.

- **DeFi is inherently higher-yield.** The current narrative is "high yields for early adopters". While it is unlikely high double digit yields on "blue chip" tokens are sustainable, users should not be anchored to the non-crypto yields in traditional finance, which must cover legacy costs and rent-seeking.

- **It's a cash and talent flush ecosystem**, with *highly* motivated developers and users. Venture funding is increasing rapidly, and many in the industry are attracted to the complexity, innovation and sense of purpose they find there.

Decentralized financial companies will compete on price / Operating cost / income ratio for banks
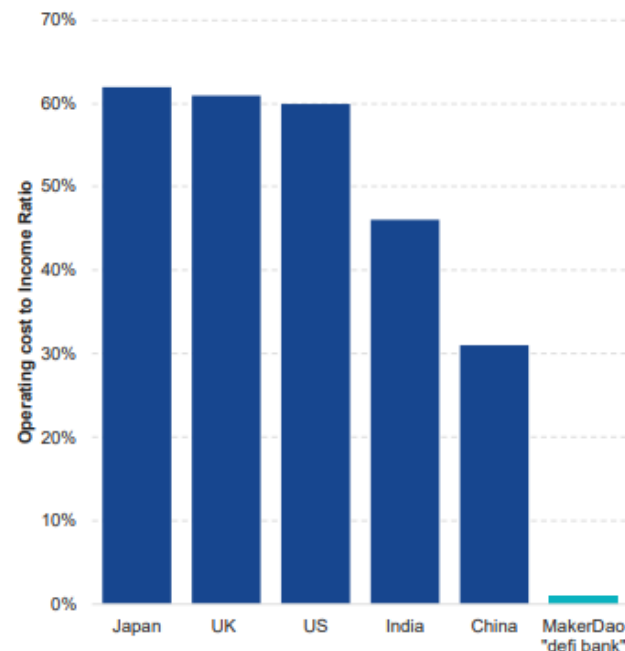
THE BLOCK | Research

Crypto/Blockchain Venture Funding by Quarter: Q1' 19 - Q2' 21
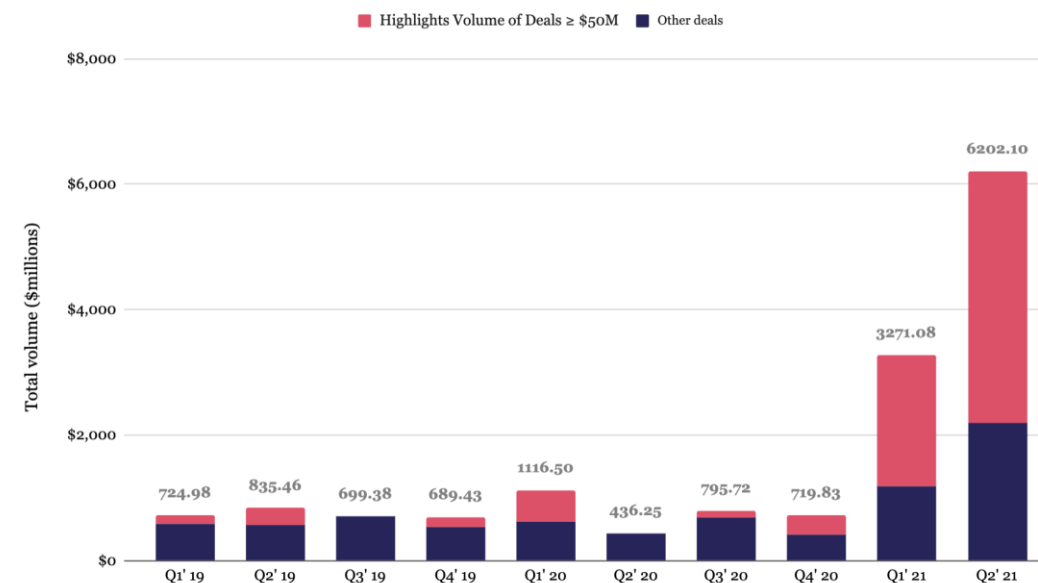
Highlights Volume of Deals ≥ $50M   Other deals

Sources: The Block, VanEck, Yusuf Hussein

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Why not DeFi?

Limited real world use cases

- Currently **circular and speculative**. Major use case is mostly more token swapping and KYC avoidance. Even sustainable stablecoin demand is primarily to facilitate token swaps, yield farming and liquidity mining.

- **Needs more real world utility** (i.e. mortgages, stable deposits, easy-access, uncollateralised loans etc.). This would require decentralized identities (DIDs) and possibly a synching with the existing legal system.

- Current onboarding (e.g. buy ETH on Binance, transfer to MetaMask, farm for yield through yearn.finance) is a **terrible UX**. But there is a high cost per line of code execution to improve this.

- Bugs, lost admin keys, and systemic crypto risks all pose **adoption challenges**.

Centralisation

- Ethereum's dApps are often **reliant on 3rd party node-aggregators** (like Infura) who often run nodes via existing cloud servers like AWS.

- This is because the time, money, and storage cost of running a node that transacts can be too high for small-time developers. These chokepoints are vulnerabilities in the ecosystem.

SYSTEMIC RISKS   ADMIN KEYS   BUGS

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Sources: Lyn Alden, Finematic
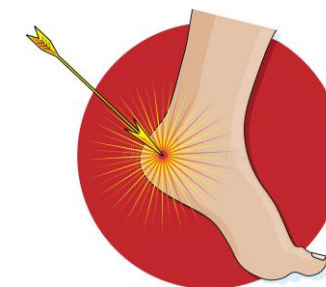
A primer on NFTs

Non-Fungible Tokens (NFTs) are the tokenization of digital assets onto a blockchain – they make previously copyable things, scarce. **If DeFi is money Legos, NFTs are media Legos.**

Current use cases include digital art, in-game/metaverse items, certificates of ownership, digitized identity certificates (a little like DIDs), etc. They have also skyrocketed in adoption over the past year.

Setting aside speculative future use cases, *right now* NFTs offer fundamentally better economics for creators. **NFTs enables creators to focus on the fat tails.**
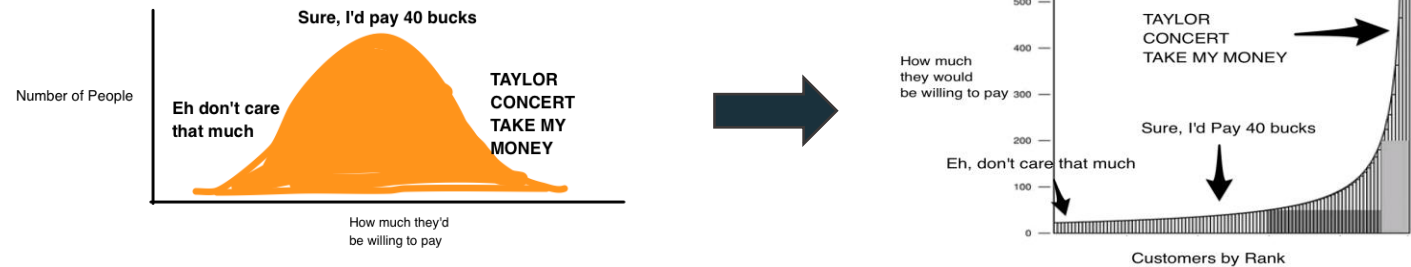
"But can't I just copy the media?" Much like how a meme is only a meme when lots of people know about it, your **ownership becomes more valuable the more people know about the original.**

Two more areas NFTs improve are: **they allow granular pricing**, and they (like DeFi) **remove rent-seeking**. More money to the creator, more <u>ownership</u> to the fans.
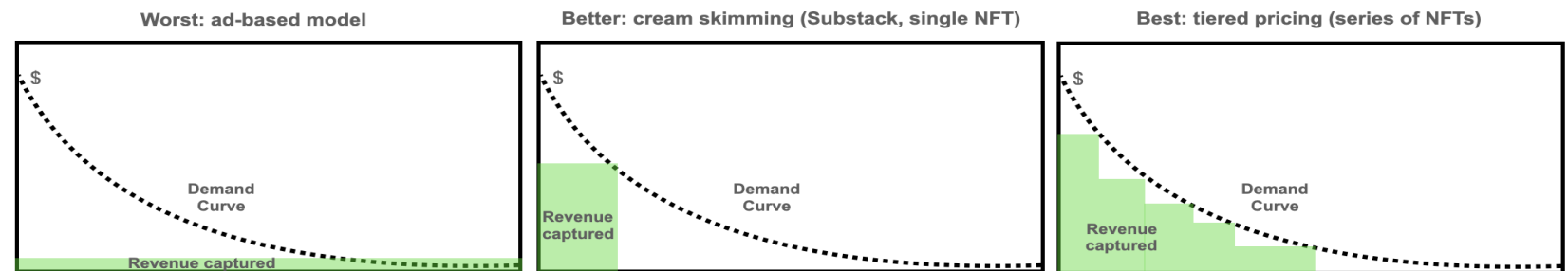
Sources: Jesse Walden, Taylor Pearson, Chris Dixon

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A primer on DAOs

"A decentralized autonomous organization (DAO) is a group organized around a mission that coordinates through a shared set of rules enforced on a blockchain." – Linda Xie.

Benefits of DAOs:

- **Transparency** – anyone can, at any time, view company financials, set tasks, task rewards and member incentives.

- **Globally accessible**, **low barriers to entry**, and **low switching costs** – if a DAO is not meeting member needs, or is evolving too slowly, members can disband quickly and form/join other organisations.

- **Easily automated decision-making** – members can trust the hardcoded impartiality, and it's a step towards AI-driven organisations.
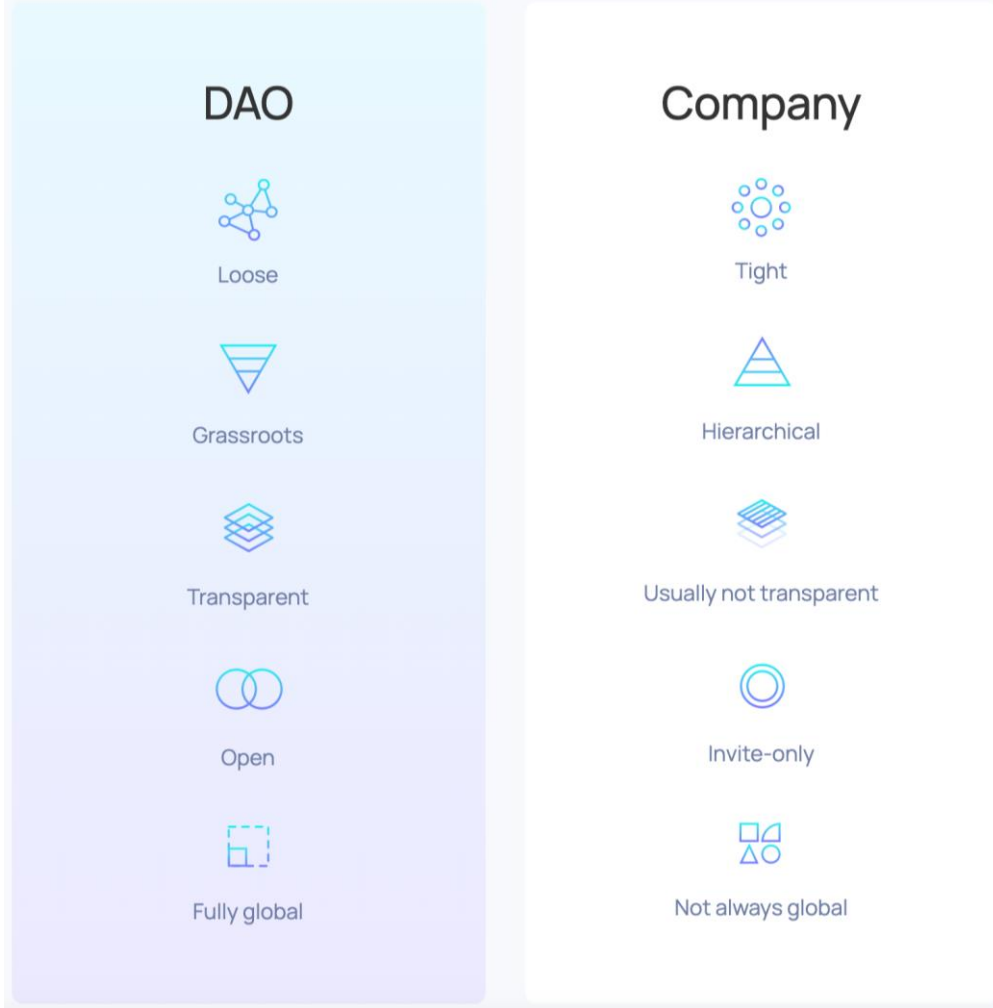
DAO	Company
Loose	Tight
Grassroots	Hierarchical
Transparent	Usually not transparent
Open	Invite-only
Fully global	Not always global

Sources: Simon Janin, Linda Xie, Packy McCormick

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The big problems with Ethereum

Scaling
- Costly gas fees prohibit frequent transactions and complex code. To make Ethereum viable, throughput needs to increase, and transaction costs need to compete with other software development platforms.

USD in Circulation
$1.7 T

Stock Market Assets
$73 T

Global Money Supply
$90 T

Bandwidth Needed:
85x

Bandwidth Needed:
3650x

Bandwidth Needed:
4500x

Existing alternatives
- Decentralisation and security are just two features. A thriving digital economy has many other equally important requirements (ease of use, real-world integration, utility-cost platforms, stability and predictability, state-adoption, etc.).
- While Ethereum is gaining these, existing alternatives have these already in spades. A large percentage of non-crypto-native adoption rests on how well Ethereum competes on these factors. Not how decentralized or secure it is.

Tough competition
- Terra, EOS, Polkadot, Cardano, Solana etc. are all rapidly growing, highly innovative, strongly motivated and cash flush teams/platforms offering several unique technical advantages over Ethereum.

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Scaling

The main problems of Ethereum 1 are it's inhibitively **high gas fees** (transaction cost), **slow transaction time** (time taken to complete a transaction), and **low transaction throughput** (amount of transactions per second).

Any scaling attempt needs to balance the scalability, with staying secure and decentralized – the **scalability trilemma**.

To compete with centralized alternatives, Ethereum needs to at least be:
- As fast,
- As cheap,
- Able to handle as much data.

Scalable

Multi-chain ecosystems

Typical high-TPS chains

Decentralized

Traditional chains (BTC, ETH...)

Secure

Already Ethereum competes with existing payment providers on cost/tx size. However, Ethereum cannot yet compete with non-financial network providers and software companies (like CDNs and cloud providers) on cost/byte. Decentralized databases inherently require higher cost per transaction than centralized alternatives, because the number of "places" where the ledger state needs to be changed/maintained are greater. Where the transaction fee is a small percent of total transactions, this is no problem. But it is **very costly to run complex smart contracts in series, where data (not money) is being transacted.**

Because DeFi is built on the idea of composability and interoperability ("Money Legos"), it's vital that scaling solutions do not inhibit the innovation that these attributes bring.

The two main ways of scaling are: improving the layer 1 (Ethereum2.0) and building layer 2s (like zk-rollups).

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Sources: Ethereum.org

Current scale (vs other layer 1's)

See more on the individual layer 1's <u>here</u>

	Solana	Polkadot	Binance SC	Eth1.0	Eth2.0
TPS	50 000	400	100	16	100 000
Avg. tx time	0.4 seconds	-	75 seconds	5 minutes	20-60 seconds
Avg. tx fee	$0.00007	-	$0.01	$4.22-$40.23	-
# validators	635	297	21	6 833	108 437
USDC/T	Yes	No	No	Yes	Yes
GitHub Stars	1.4K	2.7K	189	28.8K	1.7K
GitHub comments	13 342	1 983	11 700	19 732	5 534
Market cap	$7.4bn	$10.87bn	$40.8bn	$206bn	
Total volume	$75.8m	$1.52bn	$2.25bn	$31.84bn	

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Scaling (gas fees)

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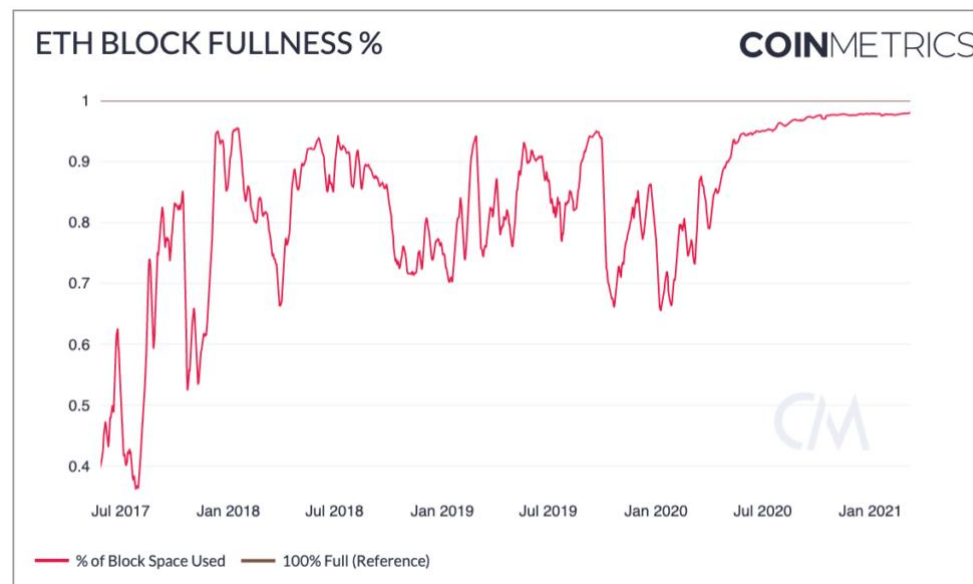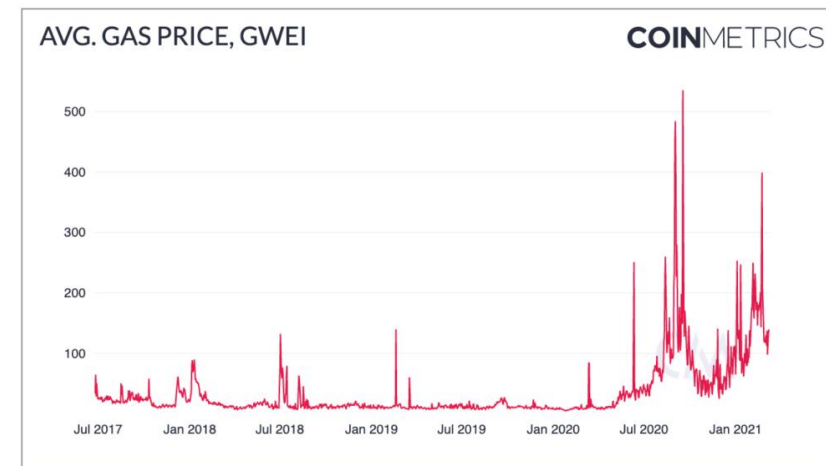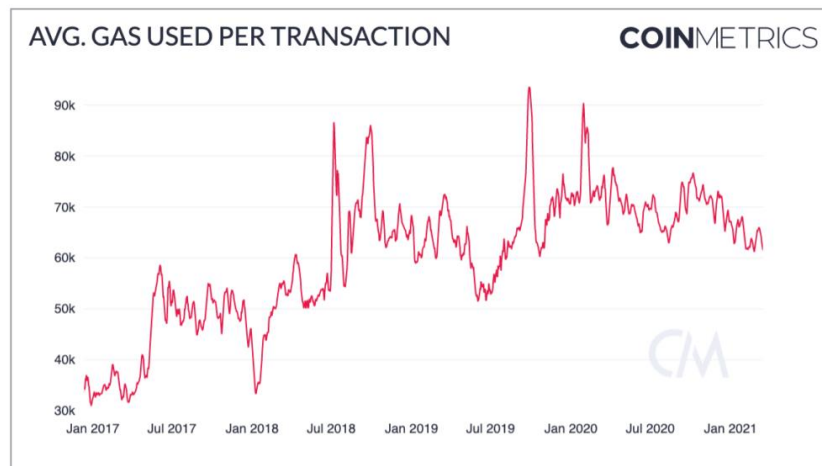
Sources: Coinmetrics
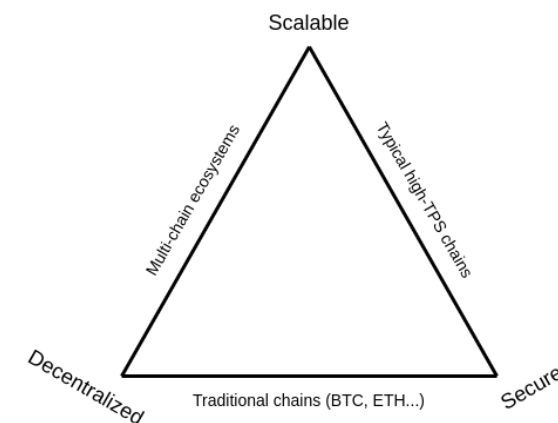
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Current scale (vs payment providers)

Where Ethereum > payment providers:

	ETH 1.0	ETH 2.0	Visa	PayPal
Cost/ transaction	$0.5-$68	TBC (est. <$0.1)	1.3%-2.55%	1.5% + $0.3
Relative transaction cost (fees/amount)	~0.45%	TBC (est. <0.1%)	~1.3%-3.5% (incl. Processor)	~2-3% (incl. interchange)
Transactions/ second	16.8	100 000	1667	193
Value transacted/year	$4tn		$2.15tn (54% market share)	$285bn
Transaction time	15s-10m	20-60s	30m-72h	30m-72h
Users (network effect)	~750 000	TBC	~3 000 000 000	~392 000 000

Where payment providers > Ethereum:

- Better UX
- Financial system integration
- Accurately forecastable cost, transaction value, transaction time
- Public sentiment (merchant acceptance, asset credibility)
- They offer fraud protection, KYC/AML and have better legal protection.

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Current scale (vs Big Tech)

"The meta purpose of blockchain is to be a decentralized internet. And the only way you do that is by replacing the cloud" – Evan McFarland

- **Around 60% of Ethereum nodes are run on either AWS, AliCloud and GCP,** as the set-up costs for full scale nodes are expensive for individual users.

- **Most devices/browsers/app-stores run on MacOS, Windows, or Android**, and with Facebook, Apple, and Google's push into wearables, they are the leading players in home IoT as well.
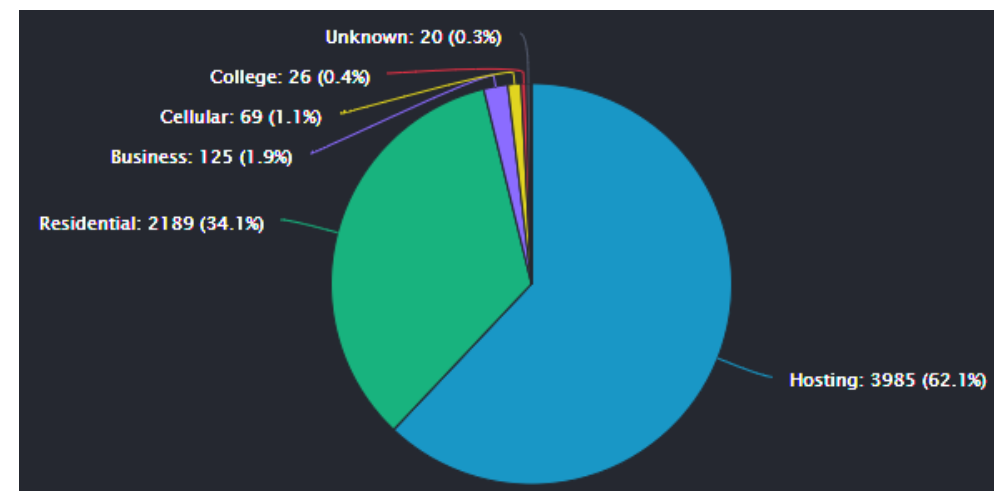
- To compete, Ethereum needs to beat Big Tech on **compute**, **storage** (local and object persistent) and **interoperability**. It is well on track with the latter. With sharding and rollups, Ethereum may (speculatively) be able to compete on computation costs within 1-2 years.

- **However, Current storage costs are ~$1.8k/mb of data stored, compared to CDNs or AWS which are virtually negligible (<$0.001).**
  - The solution here is to store packaged, encrypted and vital data on-chain and the rest in side-chains. This is safe, given the off-chain data requires on-chain data for operation, so it is still decentralised.

Sources: ethernodes.org

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Current scaling solutions

While layer 1 and 2 scaling solutions can massively **improve transaction times**, **lower gas fees**, and **expand throughput** capacity, they bring <u>their own problems</u>.

Without an interoperable "L2 bridge" layer like Polygon, **L2 solutions can fragment liquidity**, **create excess friction** when swapping between the different L2s, and **limit interoperability** (the "Lego-ness" of DeFi).

Improving layer 1

<u>Ethereum 2.0</u>
- **Divides the chain into shards**, each randomly served by dedicated nodes.
- This will **reduce network congestion** and **increase transactions per second** by creating new chains.

<u>EIP1559</u>
- EIP1559 **makes gas fees more certain** & allows for more accurate demand/supply pricing with algorithmically variable fees optimising for throughput.

Improving layer 2
These are generally protocols that collect transactions and batch them before putting them on the main chain.

<u>Rollups</u>
- Computes off-chain, but stores output on-chain.
- Still decentralised as the cryptographic output (which is needed to make sense of the data) is stored on-chain. ~10-100x scalability improvement.

<u>State Channels</u>
- Participants "stake" ETH on-chain, opening up a separate off-chain channel wherein they transact freely and frequently.
- When the transaction(s) are finished, final data is stored on-chain and the ETH staked is reimbursed.

<u>Side Chains</u>
- Other blockchains (technically L1s) which are purpose-built to interoperate with Ethereum, and use "bridges" to port final data across. These are usually less decentralized and have alt. consensus mechanisms.

<u>Plasma</u>
- Mini "child" chains anchored to the Ethereum mainnet which can be checked by the mainchain for fraud.

Web3 Tech Stack — Examples

L4 — (9) Protocol-extensible user-interface cradle ("browser")

L3 — (8) Protocol-extensible developer APIs & languages

L2 — (7) Second layer protocols
(7.1) State channels (7.2) Plasma protocols (7.3) Encrypted storage (7.4) Storage incentivisation (7.5) Heavy computation (7.6) Distributed secret management (7.7) Oracles (7.x) ...

L1 — (5) Zero/low-trust interaction protocols
(3) Data distribution protocols
(4) Zero/low-trust interaction platforms (shared security)
(6) Transient data pub/sub messaging

L0 — (1) Peer-to-peer (p2p) internet overlay protocols
(2) Platform-neutral computation description language

Sources: Oxjim, Packy McCormick, Ethereum.org

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Scaling summary

	Visa	PayPal	AWS/Cloud/CDN Providers	Bitcoin	BSC	Eth1.0	Eth2.0	Eh2.0 + scaling by 2022
Cost/$tx	>1.5%	>1.5%	-	~$2-50	$0.01	~$0.5-60	<$1	<$0.01
Cost/byte (compute)	-	-	<$0.0001		$0.01	~$0.5-60	<$0.1	<$0.01
Cost/mb (storge)	-	-	<$0.0001	~$15 000		~$1 800	~$180	~$100
Tx/second	1 667	193	~100 000 000	5	100	17	~100 000	~100 000 000
Latency	Medium	Medium	Low	Medium	Low	Medium	Low	Low
Redundancy risk	Medium	Medium	Medium	Low	Medium	Low	Low	Low
Interoperability	Medium	Medium	Medium	Low	Medium	High	High	TBC

Ethereum currently **outcompetes all alternatives on interoperability**, and **cost/transaction** when the transaction requires absolute validity.

Ethereum will be competitive when used as a computation platform when a premium is afforded data privacy and decentralisation but will still be around 10x more expensive than centralized, off-chain alternatives without the premium. Speculatively, future scaling may solve this.

Ethereum will **likely never be competitive as a storage platform**. It may one-day compete by outsourcing storage to side-chains, but that is speculative for now.

Sources: Throughout this slide deck, Amazon.com, Ethereum.org

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Transaction cost and usage

Sources: Etherscan.io

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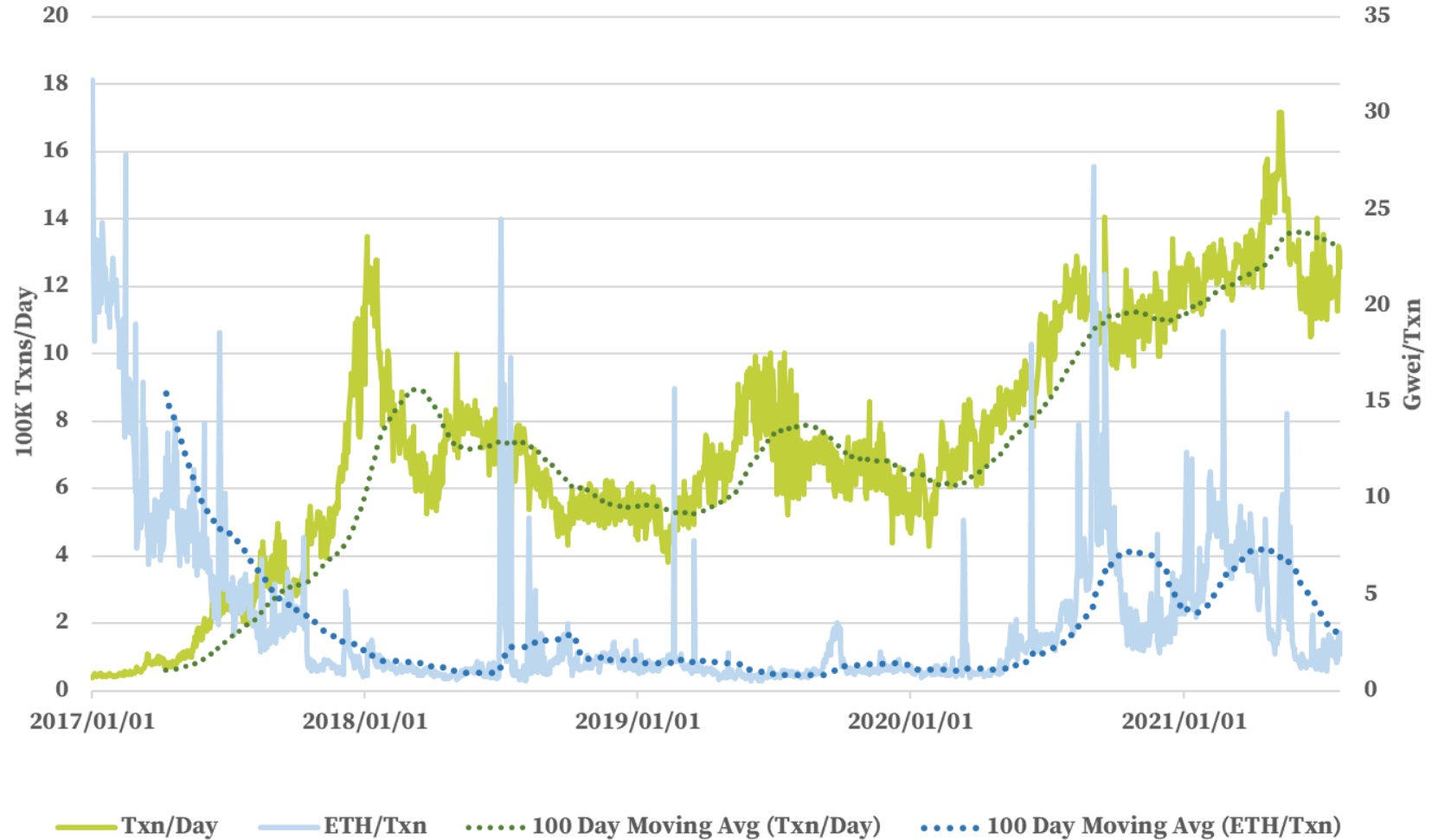
Special Situation: Illiquidity & Volatility

- Nikhil Shamapant's extensive essays on this – <u>Ethereum, the Triple Halving</u> and <u>Ethereum, Moving the Gas Underground</u>

- Nikhil's core argument is this:
    - Consensus valuation levels are $30-50k for Ethereum.
    - **The "triple halving" is an upcoming structural supply reduction caused by the EIP1559 & Proof-of-Stake merge hard forks.**
    - Together these will **cause a ~90% reduction in the free "float" of purchasable Ether**. Mostly driven by:
        - Net deflationary effect of gas fee burn.
        - Miner sell pressure dropping.
        - ETH staking at ~10% initial yields. DeFi lockups at >ETH-staking yields.
    - At current demand levels, this will obviously cause price to rise.
    - Crypto is highly reflexive, so a rising price will spur narrative adoption, driving demand and exacerbating the demand/supply mismatch.
    - **Like a short-squeeze, the sudden illiquidity will drive the ETH price** north of $150k.

- This would require a market cap of ~$17 trillion for Ethereum. Seemingly absurd.

- But, **circulating supply is the determinant of price, not total supply,** so far less than ~$17T is necessary to get Ethereum to $150k should Nikhil's argument around supply dynamics be correct.

- Nikhil introduces the idea of the **creation of a liquid derivative market for staked Ether** – stETH. This allows for ETH to be monetized while still staked, and for staking of non-validator-node ETH.

- Nikhil further argues the arbitrage opportunities in these derivative markets will push staking yields sub 2%. This would mean **>90% of ETH would be staked**.

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Competitive Threats

- **Relatively low switching cost for utility protocols.**
  - This is increasingly offset by the interoperability requirements for L1s and the L2s stacking atop them.

- **Central bank digital currencies** (CBDCs)
  - Unlikely to be as programmable or as interoperable as Ethereum, thus unlikely to have as sophisticated an ecosystem develop atop it.

- **Most people won't read code. The unbanked won't "verify".**
  - Trust – of code, or people – is an inevitable part of a world with division of labour.
  - Improving UX and subsidised/lower gas fees solves this.

- **Decentralisation is not worth the cost.**
  - It is possible companies won't want to develop on-chain, simply because the compute cost of doing so is higher than the cloud/CDN alternative. If this is widespread enough, the use case for crypto become limited exclusively to value transfer.
  - However, to believe this, you have to believe that innovation in the crypto community will not be able to continue finding ways to lower gas fees, and that the use cases for NFTs, DAOs and DeFi are either unnecessary, or replicable through big tech.

Weekly Tether Transaction Count (Ethereum, Tron)

USDT-ETH
USDT-TRX

Source: Coin Metrics, CoinDesk Research
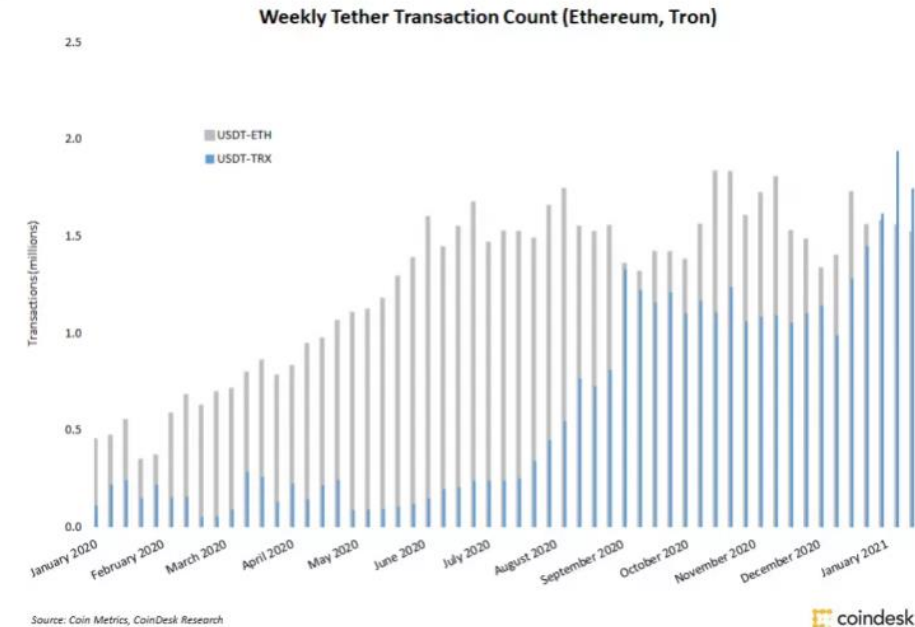
coindesk

Tether weekly transaction count on Ethereum and Tron
Source: Coin Metrics, CoinDesk Research

Sources: Coindesk

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External Threats

- **State can shutdown the fiat-crypto gateway,** hamper the dApp portals, or prevent regulated entities from interacting with Ethereum-based dApps.
  - China's ban on crypto, implementation of CBDCs and WeChat/Alipay's dominance in payments sets global precedent for state-owned crypto.
  - VPNs could circumvent this, but the increased user friction and associated stigma would curtail adoption.
  - With institutions adopting L1s as investments this is unlikely.

- **Quantum computing**
  - For all the bits of the Ethereum protocol that are susceptible to quantum (ECDSA, BLS signatures etc.), there are already well-known and in-place alternatives that are quantum proof.
  - These alternatives are less efficient at processing (even w/the sharding). As compute improves, these will become more efficient to the point where they're comparable with the current protocol stack. Here's Vitalik talking about it

- **Sovereign risk** – geopolitical tensions could cause a hostile attack. This would be a more late-stage risk.
  - Given the cost of staking is the downside for a 51% attack failure, the more Ethereum is worth, the harder it is to attack.

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External Risks

- **Institutions require liquidity.** The special situation pitch relies on illiquidity. This may put off institutional adoption until stETH provides a secure and liquid market.
  - **ETFs are not passed by the SEC** and regulatory pressures prevent institutional adoption.

- **Crypto is not tied with property law**.
  - Pro: abrogation of property rights is impossible.
  - Con: repossession and 90% of the history of the legal system is not applicable here.

- **DeFi is highly levered**. Although collateralised, what happens if all these positions are liquidated because the value of the collateral drops off?
  - The more folk stake on one provider, the greater single staker risk becomes.

- **Illiquidity doesn't necessarily mean upside volatility**. Sentiment may turn and outflows tank the price, especially if ETH is still priced in line with BTC.

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Internal Risks

- **Rollout delayed** or a **faulty upgrade.**

- **Ecosystem adoption fails to spur token price.**
  - Transaction fees are too low after scaling for fee burn to have an impact on price.
  - Ethereum's high-throughput, low-take-rate approach may render it a utility which doesn't accrue enough value to token holders.

- **Scaling fails to reduce fees.**
  - Unlikely, as many protocols are already showing 100x improvements on computation cost.

- **Miners don't pass Eth2 merge**
  - They are incentivized to maintain proof-of-work system.
  - Governance and hearing the multiple different voices (developers, miners, investors etc.) is a growing need in crypto.

- **Code bugs**
  - There have been several bugs allowing exploit or contract failure. In Ethereum, the DAO hack was the most well known. However, given the auditing and extensive research on Ethereum's core protocol, I don't think this is too likely.
  - Bugs are more likely to occur in L2s and products built atop Ethereum.

- **DeFi fails to gain sufficient adoption**, making Ethereum's pricing system highly inefficient.
  - If staking yields aren't sufficient, there won't be a premium for arbitrage between ETH and staked ETH. This prevents efficiency in the staking market

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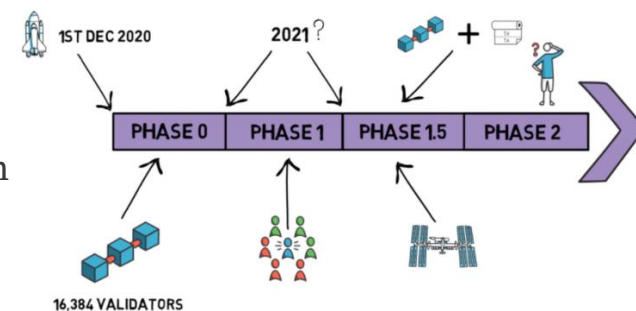
Risks & Threats Summary

"… Speculators should understand that the base layer of Ethereum is still in alpha development, with rapid change in terms of its security model, monetary policy, and addressable market, at a time when competition in the smart contract industry is not insignificant." – Lyn Alden

Competitive Threats	External Threats	External Risks	Internal Risks
Central Bank Digital Currencies (eCNY in particular)	States increase anti-crypto regulation	Institutions prevented from investing due to illiquidity	Ecosystem growth doesn't accrue to token holders
Low switching costs and competitive L1s	Quantum computing	SEC rejects ETF construction	Delayed/faulty rollout
Cloud/CDNs become scaled/secure and able to trustlessly validate before ETH competes on compute cost	Sovereign risk of a 51% attack attempt increases with price	Generally negative crypto sentiment is exacerbated by ETH's illiquidity	Scaling fails to reduce fees
Majority of users won't care about verification. Existing alternatives have better UX.		Leverage-fuelled collapse in DeFi tanks ETH price	Miners reject PoS merge
		Crypto's unknown status in property law prevents repossession	Lack of DeFi adoption spurs inefficiency in ETH pricing
			Code bugs

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Common non-technical crypto concerns

"Poor Gini coefficient"
- **Basis:** <u>Claims by media</u> that the enormous bulk of Bitcoins are owned by an elite minority of addresses.
- **Rebuttal:** This is misapplied address analysis. Many addresses will be empty by design, many will represent millions of owners. A <u>longitudinal study of clustered addresses</u> would be more accurate. *However, even these studies suggest unusually high levels of inequality. <u>Ethereum is similar.</u>*

"Enables criminality"
- **Basis:** Bitcoin was associated with Silk Road transactions in 2014.
- **Rebuttal:** Technology is amoral. Fiat onramps, the tying of IPs to addresses, and the publicity of blockchain all mean its anonymity is not absolute, and <u>prosecution is entirely possible</u>.

"Token appreciation discourages its use"
- **Basis:** Economic understanding that <u>HODL culture induces hoarding</u> and cannot underpin generosity, proactive capital, or transactions.
- **Rebuttal:** This is a well covered economic debate from before Bitcoin's inception. Austrian economists (<u>Rothbard</u>, <u>Mises</u>, etc.) hold that investment (requiring a low public time preference) spurs economic growth more than consumption (as per the <u>Keynesians</u>). The argument that volatility prevents crypto from becoming a true money is discussed <u>here</u>.

"The world needs centralization/ Individual sovereignty is antisocial"
- **Basis:** Typically, a political/cultural/religious belief in the appointment of government and centralized bodies as both better decision-makers and the top of a justly hierarchical system.
- **Rebuttal:** Decentralisation allows centralisation around more localized nodes. A <u>divisible sovereignty</u> removes the "monopoly of power" from an individual entity. Crypto is a tool to enable the sliding scale between absolute centralisation and absolute decentralisation.

I recommend reading <u>here</u> for more FAQ (on Bitcoin) and <u>here</u> (Ethereum).

Sources: CaseForBitcoin, Willy Woo, Bloomberg

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THE PITCH

THE BASICS

FUNDAMENTALS

DEFI, NFTS & DAOS

THE REAL WORLD

FLOWS & LIQUIDITY

RISKS & THREATS

➡ VALUATION

Existing analyst valuation bases

Stock-to-Flow models:
$5 700-$28 000

Staking super cycle:
$7 000 – $10 000

Metcalfe's Law:
$20 000

"Supply squeeze":
$150 000

$1 000/ETH

$10 000/ETH

$100 000/ETH

My rough valuation:
$5 500

Comparable payments network/
discount cash flow: **$16 000**

My valuation

Revenue	Expenses	Cash Flow
Transaction fees, paid in ETH	Previously high mining costs, post-Proof-of-Stake, it will be low staking costs.	99%+ margins, profits accrue to ETH holders (through tip fees and burned ETH supply)

$ETH = Zero growth existing business DCF **+** expected value of potential growth **+** optionality

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Sources: Ryan Berckmans, Vivek Raman, Fred Liu, Michael Mauboussin

Valuing Ethereum (Core)
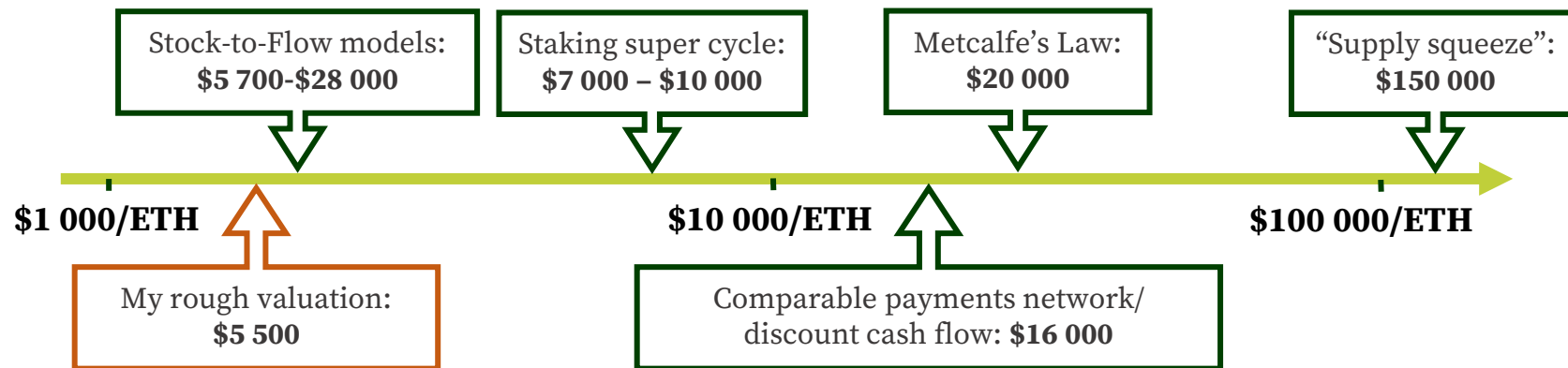
Discount Rate	15%

DCF Value/ ETH	$300

THE PITCH

THE BASICS

FUNDAMENTALS

DEFI, NFTS & DAOS

THE REAL WORLD

FLOWS & LIQUIDITY

RISKS & THREATS

➤ VALUATION

	Growth Rate	Sales (USD)	"FCF" Margin	"FCF"	Present Value	
2015	-	2 402	4%	96	-	
2016	6 070%	148 188	5.3%	7 854	-	
2017	31 468%	46 779 938	12%	5 613 593	-	ICO Boom
2018	241%	159 707 973	5.7%	9 103 354	-	
2019	-78%	34 583 195	-8%	-2 766 656	-	
2020	1 624%	596 193 224	8%	47 695 458	-	Today
2021E	1 242%	8 000 000 000	8%	640 000 000	556 521 739	EIP1559
2022	0%	8 000 000 000	99%	7 920 000 000	5 988 657 845	PoS Merge
2023	0%	8 000 000 000	99%	7 920 000 000	5 207 528 561	
2024	0%	8 000 000 000	99%	7 920 000 000	4 528 285 705	
2025	0%	8 000 000 000	99%	7 920 000 000	3 937 639 744	
2026	0%	8 000 000 000	99%	7 920 000 000	3 424 034 560	
2027	0%	8 000 000 000	99%	7 920 000 000	2 977 421 356	
2028	0%	8 000 000 000	99%	7 920 000 000	2 589 062 049	
2029	0%	8 000 000 000	99%	7 920 000 000	2 251 358 303	
2030	0%	8 000 000 000	99%	7 920 000 000	1 957 702 872	
2031	0%	8 000 000 000	99%	7 920 000 000	1 702 350 324	

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Valuing Ethereum (Growth)

TAM Expected Value (1x Sales)/ETH	$1 945

Total Addressable Market

- Bear in mind: there may be considerable overlap between industries. Plus complex adaptivity means one sector adoption (payments) will strongly effect another (remittances).
- This is just rough directional heuristics.

Market	Size ($'bn)	At 5% capture ($'bn)	Likelihood	Expected Value ($'bn)
Payments	5 400	270	15%	40.5
E-Commerce	9 100	455	5%	22.8
Remittances	930	46.5	15%	6.9
Wealth Management	1 200	60	15%	9
Gold Market	10 000	500	10%	50
M1 Money Supply	19 000	950	5%	47.5
Banking	7 500	375	5%	18.8
Art/Collectibles	52	2.6	15%	0.4
Gaming	180	9	15%	1.4
Music	60	3	5%	0.15
Supply Chain Management	16	0.8	10%	0.08
Prediction Markets	8	0.4	15%	0.06
Networking/IoT	1 463	73.15	5%	3.7
Insurance	4 475	223.75	10%	22.4
Storage	80	4	5%	0.2

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Option Value/ETH	$2 297

Black-Scholes

- Again, just heuristics.
- See example use <u>here</u> on pricing real world options for growing businesses.

Type of Option	Call
Stock Price	$2 234
"Strike Price"	$33 529
Time (years)	10
Risk Free Rate	15%
Annualized Volatility	65%
Option Price	**$1 099**

Total Addressable Market

- See previous slide.
  - Assume capturing of **10% market share**.
  - Assume **25% likelihood.**
  - Assume average **market growth rate of 10%** per year to 2031.

Type of Option	Call
Stock Price	$2 234
"Strike Price"	$26 152
Time (years)	10
Risk Free Rate	15%
Annualized Volatility	65%
Option Price	**$1 198**

Total Addressable Market

- See previous slide.
  - Assume capturing of **65% market share**.
  - Assume **3% likelihood.**
  - Assume average **market growth rate of 10%** per year to 2031.

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Valuing Ethereum (Summary)

Core Ethereum (no growth)	$300
Base growth (TAM)	$1 945
Optionality	$2 297
Present value per ETH	$4 542
+ 2% deflationary burn/year for 10 years	$906
Total	**$5 448**

Assumes continued use of ETH in DeFi.

Assumes continued growth of NFTs, DAOs and DeFi in existing verticals

Prices for outlier success and adoption

Valuation Breakdown

7%

50%

43%

$5 448
$2 234

- Core ETH
- Core Growth
- Optionality
- ETH Price

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RECOMMENDED READING
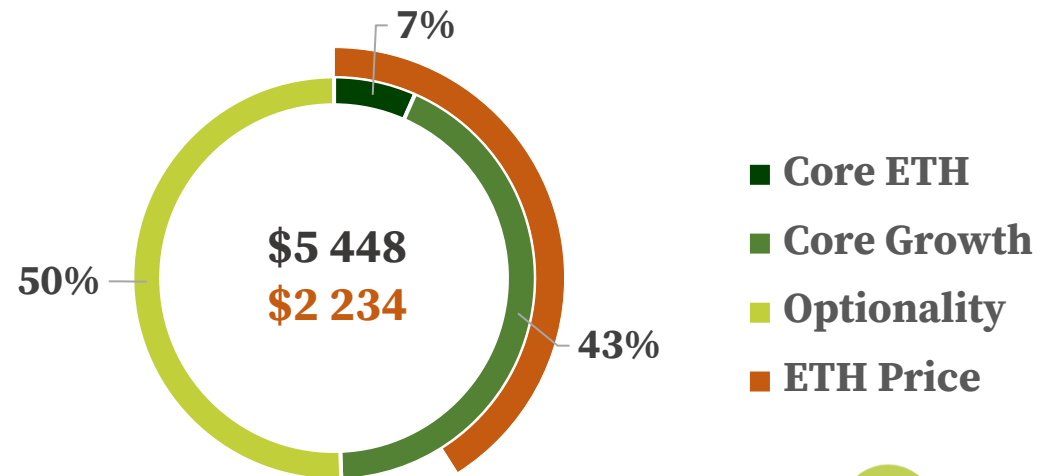
Recommended Reads

- a16z's primers on NFTs and Crypto

- Eli Dourado's Case for Ethereum Maximalism

- Andrew W's The next FinTech: Global "Open Finance" Infrastructure

- Nikhil Shamapant's Ethereum, the Triple Halving and Ethereum, Moving the Gas Underground

- Nugroho Gito's Ethereum 101 and Daniel Chan's Ethereum in a Nutshell

- David Hoffman's A New Model For Money

- Tim Beiko (YouTube) "It's Almost Like EIP-1559 Fixes an Economic Bug in Ethereum; More Usage Can Now Capture More Value"

- Vitalik Buterin Why Proof of Stake

- Saifedean Ammous The Bitcoin Standard & Stephanie Kelton's The Deficit Myth

- Packy McCormick's Not Boring Substack

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PARTING THOUGHTS

Blockchain is not a novel way of transferring data, it's a novel way of transferring value. *Crypto transfers value faster, cheaper, and with more rapid growth in their ecosystem than any centralised payments system.*

Regarding competition with data transferers (like cloud and CDN providers), there are two questions to ask. How much of a premium should we put on data validity? And **are we willing to bet that crypto will innovate ahead of a non-crypto scale model which can transfer verified data at a lower cost?**

Who could do this? I'd wager web2 incumbents or a new, scaled web2 entrant. Traditional finance doesn't have the capability. **Web2 incumbents would need to circumvent interchange/Visa** *(ala Alipay/WeChat Pay), else fees are more costly than ETH gas. Web2 requires a closed loop.*

In a balance of probabilities, given the standoffs between web2 leaders, I think it is more likely that crypto proceeds to take market share across the board than that web2 either cooperate or establish a dominant market. *Oddly though, Facebook seems best positioned here. I am sure Mark realized this with Libra/Diem.*

Geopolitical tensions prevent WeChat/AliPay adoption in much of the West, while Big Tech oligopoly prevents a closed system from arising naturally there too. Western proclivity for individualism may feed into the crypto narrative too.

In competing on compute, data storage, and interoperability, cloud providers still lead Ethereum. It is possible that AWS/AliCloud can leverage their non-cloud prowess and spur innovation on their platforms, with APIs linking various products/services. This is incrementally better.

Blockchain-native apps are in their infancy but offer potential for disruptive improvements over the existing system. An <u>*analogy*</u> *I heard is* **"Cloud is Intel's x86, and blockchain is ARM"**. *The one technology* seems *fundamentally superior – it's widely adopted and wins in most every metric – while the other looks limited in scope and inferior. Yet, it's the pace of innovation in blockchain, plus its interoperability, verifiability, and decentralisation which all make it a fundamentally different product.*

Undoubtedly, there is room for both. However, with time, blockchain can do what the cloud can do (cf. <u>DFINITY</u>*). The reverse will not hold.*

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PARTING THOUGHTS

"Kind of like a bet on a startup company management team, a bet on Ethereum is a bet that the developers will perform a massive transformation on the base layer and successfully maintain its dominant network effect against competitors." – **Lyn Alden** (2021)

"You come to the realization that the blockchain is really a general mechanism for running programs, storing data, and verifiably carrying out transactions. It's a superset of everything that exists in computing. We'll eventually come to look at it as a computer that's distributed and runs a billion times faster than the computer we have on our desktops, because it's the combination of everyone's computer." - **Tim Sweeney** (2017)

"As great as open-source software development has been, far more people are willing to do far more things for money than for free, and suddenly all those things become possible and even easy to do. Again, it will take 30 years to work through the consequences of this, but I don't think it's crazy that this could be a civilizational shift in how people work and get paid." – **Marc Andreesen** (2021)

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THANK YOU

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