

Neutrality in Ethereum's Block Creation Process



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Ethereum's main export: property rights

- Personal take (caveat emptor): the most important and differentiating element of Ethereum is the digital property rights it exports.
- *The core promise*: anyone can store, send, and receive ETH from anywhere on earth – a permissionless store of value.
- Two conditions necessary to fulfill this promise:
 1. ETH is valuable.
 2. Censorship is prevented.
- We will explore the micro- and macroeconomic considerations.

Ethereum's main export: property rights

1. ETH is valuable.
 - ▶ ETH as a *capital asset*.
 - ▶ ETH as a *consummable/transformable asset*.
 - ▶ ETH as a *Store-of-Value asset*.
2. Censorship is prevented.

The bigger picture of Ethereum design



- “*Block production is centralized, block validation is trustless and highly decentralized, and censorship is still prevented.*” – Vitalik¹
 - *block production is centralized*
 - ⇒ **design goal #1: encourage builder competition.**
 - *block validation is trustless and highly decentralized*
 - ⇒ **design goal #2: limit the value of validator² sophistication.**
 - *censorship is prevented*
 - ⇒ **design goal #3: preserve the neutrality of block space.**

¹<https://vitalik.eth.limo/general/2021/12/06/endgame.html>

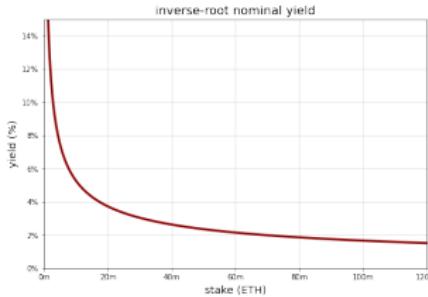
²N.B., I notationally abuse the word validator.

Validator rewards taxonomy

Issuance

- Issuance rewards incentivize validators to participate in consensus by creating new tokens (inflation).
- The amount of yield (interest) paid depends on the amount of stake,

$$\text{yield} = \frac{2.6 \cdot 64}{\sqrt{\text{staked ETH}}}.$$



- These rewards are mostly from voting for the correct block.

<https://notes.ethereum.org/@mikeneuder/subsol>.

Validator rewards taxonomy

Transaction fees

- Transaction fees are the amount users pay to interact with Ethereum.
- Fees are split into two parts.
 1. *Base fee* - dynamically updated based on current market demand.
 2. *Priority fee* – a tip to the block producer for inclusion.



- Priority fees have extreme variability block-to-block.

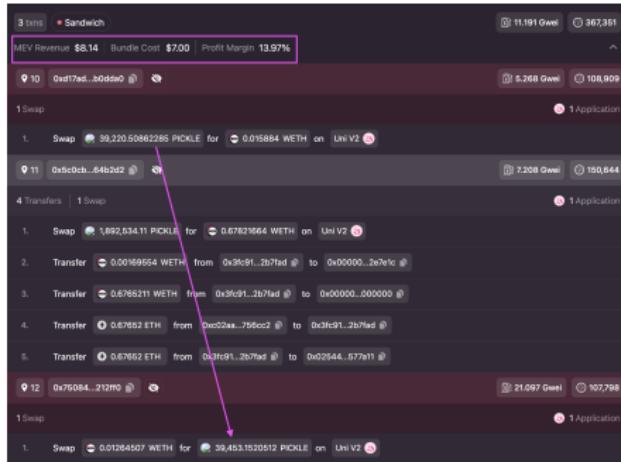
5,126,816 (17.09% -66%)	30,000,000	5.82 Gwei	0.01478 ETH
29,866,784 (99.56% +99%)	30,000,000	5.17 Gwei	0.42494 ETH

<https://www.blocknative.com/gas-estimator>.

Validator rewards taxonomy

MEV

- *Maximal Extractable Value* (abbr. MEV) is the value created from the ability to reorder and insert transactions.



- Other MEV types: atomic and non-atomic arbitrage, liquidations.
- MEV is variable in market conditions and builder sophistication.

<https://sorellalabs.xyz/dashboard>.

Validator rewards taxonomy

Summary



- *Issuance* is stable and not very gameable.
- *Tips* are highly variable both in market conditions. *MEV* is variable both in market conditions and the sophistication of the block producer.

<https://ultrasound.money/>.

<https://mevboost.pics/>.

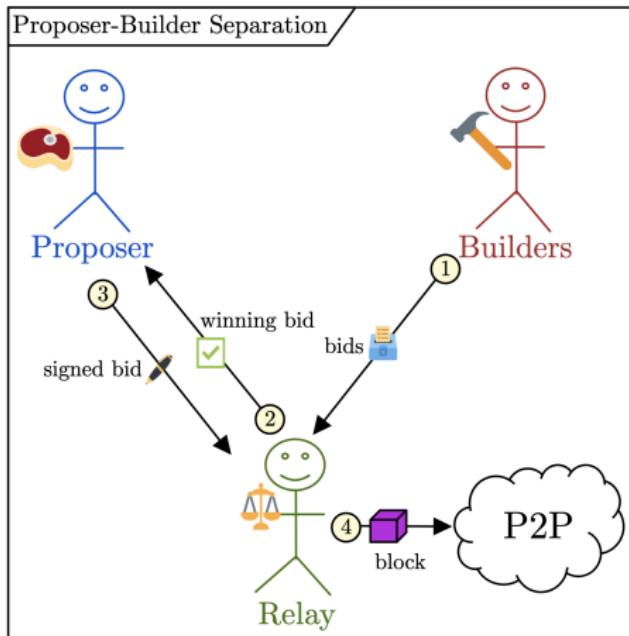
Validator rewards taxonomy

Summary

- *Potential concern #1:* MEV distorts the network incentives.
- *Potential concern #2:* MEV gives outsized market power to centralized actors. (recall: “Censorship is prevented.”)
- *Potential concern #3:* MEV changes the monetary properties of ETH. (recall: “ETH is valuable.”)

Ethereum, the protocol

Current block production pipeline

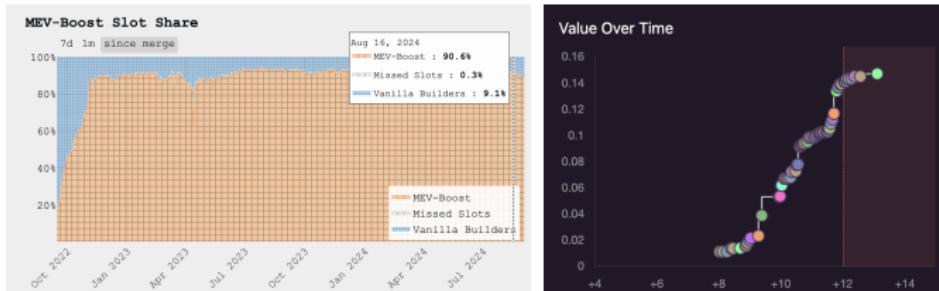


- ① **The builder bids** in the auction through the relay.

Ethereum, the protocol

Current block production pipeline

- The relay brokers the fair exchange to allow *all* validators to participate in the MEV market if they want to...
- and most want to...
- but there are still games to played...
- and the market structure gives immense power to builders.



<https://mevboost.pics/>.

<https://sorellalabs.xyz/dashboard/>.

Ethereum, the protocol

Removing arbitrary transaction exclusion



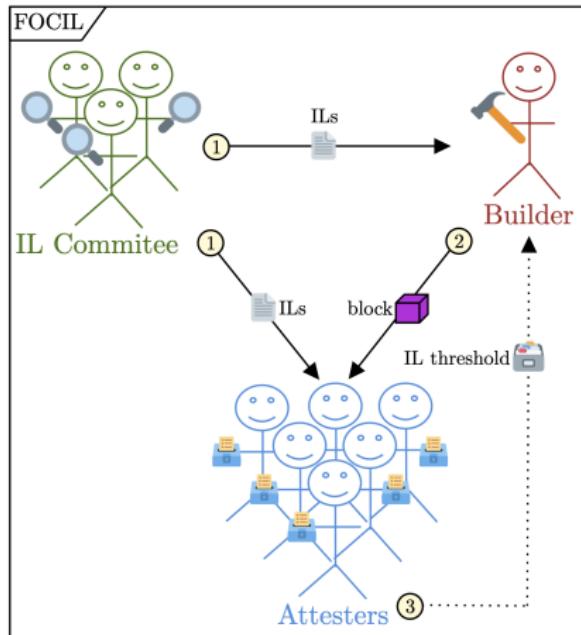
- Block builders have outsized influence in the protocol because they determine which transactions to include and in what order.
- *How can we rely on the decentralized validator set?*
- *Idea #1:* Can validators provide a “block template” that the builder must follow?¹
- *Idea #2:* Can multiple validators co-create this template?²

¹<https://ethresear.ch/t/no-free-lunch-a-new-inclusion-list-design/16389>

²<https://ethresear.ch/t/fork-choice-enforced-inclusion-lists-focil-a-simple-committee-based-inclusion-list-proposal/19870>

Ethereum, the protocol

Removing arbitrary transaction exclusion



- ① **The IL committee publishes** their inclusion lists to the builder and the attesters.

ETH, the asset

Historical context

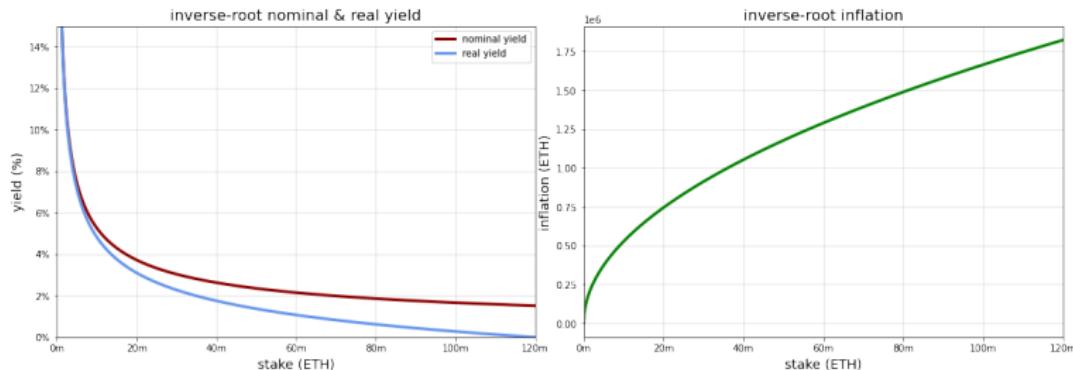


- Aug. 5, 2021 – EIP-1559 activates and starts burning the base fee.
- Sept. 15, 2023 – The Merge, no more Proof-of-Work mining.
- March 13, 2024 – EIP-4844 activates and makes data cheaper.

https://ycharts.com/indicators/ethereum_supply/chart

ETH, the asset

Yield & Inflation

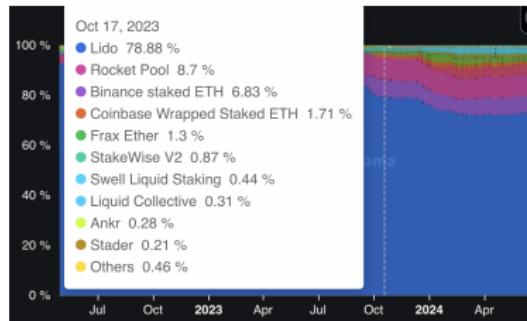


- Inflation hurts the monetary properties of the asset:
 1. Eliminates real yield from staking.
 2. The native token becomes expensive to hold.

ETH, the asset

Exogenous forces

- What could increase the amount of demand for staked ETH?
 1. Interest rate adjustments.
 2. Staked ETH ETF potential.
 3. ETH price appreciating.
 4. MEV distorting validator incentives.
- Potential issues beyond inflation:



Oct 17, 2023

James Seyffart @JSeyff ...

What are we expecting today for the Ethereum ETFs?

We expect them to begin trading tomorrow. That means we should see a bunch of filings on SEC site today that say the ETFs' prospectuses have gone "effective". Likely after or around market close. Here are the race entrants:

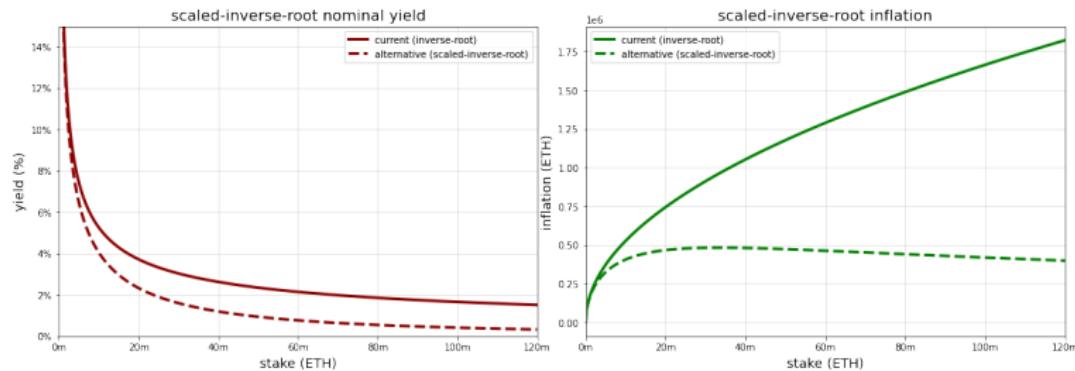
Name	Ticker	Starting Fee	Post Waiver Fee	Waiver Length	Waiver Amount	Exchange	Custodian
Argonaut Ethereum Mint Trust	ETH	0.0%	0.1%	0 Month	\$2.5 Billion	NYSE	Citibank
Franklin Ethereum ETF	EETF	0.0%	0.1%	Used 10/21/28	\$16.0 Billion	CBOE	Citibank
Vanguard Ethereum ETF	ETHV	0.0%	0.20%	1 Year	\$15.5 Billion	CBOE	Genstar
State Street Ethereum Fund	SETH	0.0%	0.21%	6 Months	\$0.5 Billion	NYSE	Citibank
3iShares Core Ethereum ETF	GETH	0.0%	0.21%	3 Months	\$0.5 Billion	CBOE	Citibank
Fidelity Ethereum Fund	FETH	0.0%	0.25%	Used 12/21/24	UNLIMITED	CBOE	Fidelity
iShares Ethereum Trust	ETHA	0.12%	0.25%	12 Months	\$2.5 Billion	Nasdaq	Citibank
Proshares Ethereum Strategy ETF	ETHW	0.2%	0.25%	12 Months	\$0.5 Billion	Nasdaq	Citibank
Grayscale Ethereum Trust (Conversion)	ETHG	0.0%	0.25%	None	None	NYSE	Grayscale

<https://defillama.com/lst>

<https://x.com/JSeyff/status/1815395664051818873>

ETH, the asset

Proposed issuance changes



- How (if at all) should we think about modifying a decentralized monetary policy?

thanks :)

