

# Liquidity Unleashed: A Research-driven Analysis of Post-Shanghai LSDs

ETHChicago 2023

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August 20, 2023

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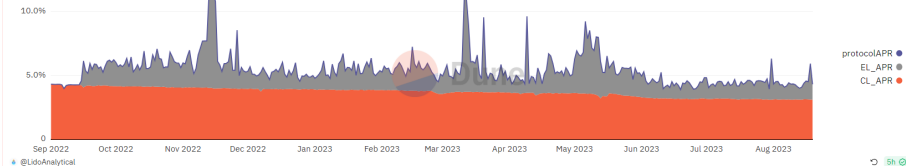
# History of Ethereum Staking

- The Merge (Sep 2022): Ethereum migrated from PoW to PoS  
⇒ Now anyone can stake 32Ξ on mainnet and accrue rewards as a validator
- The Shapella/Shanghai Upgrade (Apr 2023)  
⇒ Introduced option to withdraw staked ETH (unstake)

# Breakdown of Ethereum Staking Rewards

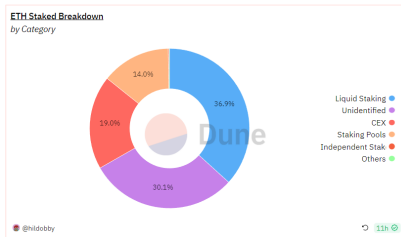
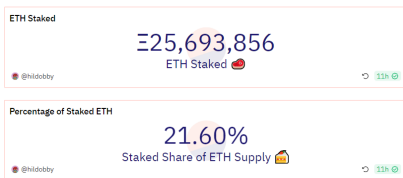
- Consensus layer rewards: Attestation, block proposal, sync committee
- Execution layer rewards: Txn fee (EIP-1559), MEV

Protocol APR\*: Consensus Layer (CL) APR and Execution Layer (EL) APR Lido post Merge APR  
Dune SQL



source: @LidoAnalytical on Dune

# ETH Staking Landscape



source: @hildobby on Dune

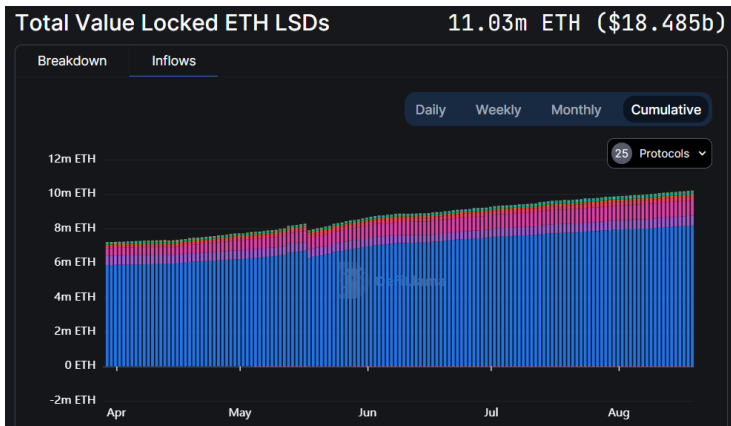
# Liquid Staking Derivatives (LSDs)

Actors: stakers, staking pools, node operators

- ① Stakers deposit ETH into staking pools in exchange for LSDs
- ② Staking pools delegate batches of  $32\Xi$  to NOs to run Ethereum validators and earn staking rewards
- ③ LSDs can be traded on AMMs, used as DeFi collateral, etc.
- ④ LSDs are redeemable for ETH at any time

Most LSDs accrue rewards automatically i.e. **holding LSDs is equivalent to staking ETH in the pool**

# LSDs saw huge growth after Shapella



source: DeFi Llama

# Liquid Staking Pools as Banks

- <sup>1</sup>Banks are financial intermediaries which creates liquidity by:
- Holding liquid funds (e.g. customer deposits) as liabilities
  - Investing in illiquid investment projects (e.g. loans, bonds) as assets

|            | Banks             | Liquid Staking Pools |
|------------|-------------------|----------------------|
| Invests in | Loans             | ETH validators       |
| Deposits   | Checking accounts | ETH deposits         |

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<sup>1</sup>Diamond and Dybvig (1983) Theory of Banking



# Supply and Demand Analysis

# How Liquid are LSDs, Really?

Introducing quantitative measures of liquidity queues

# Risks

- Liquidity risk: e.g. CRV exploit July 2023
- Price risk: e.g. ETH price drop
- Bank runs

# More Risks

- APR drop
- Inflationary ETH

# LSD Risk Simulations

# References I

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- Diamond, D. W., & Dybvig, P. H. (1983). Bank runs, deposit insurance, and liquidity. *Journal of political economy*, 91(3), 401–419.