“Inclusion and Democratization Through Web3 and DeFi?
Initial Evidence from the Ethereum Ecosystem”
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Outline

1. The Promise of DeFi
2. Overview of Results
3. Comments
4. Summary
What problems is decentralized finance (DeFi) solving?

Widely believed that DeFi has potential to

- Improve the transparency of the financial system
- **Reduce intermediation costs**
- **Improve accessibility and financial inclusion**
- Reduce social costs and negative externalities imposed by traditional centralized institutions

**Question:** are DeFi and its underlying blockchain technologies realizing this potential?

- **This paper.**
The Promise of DeFi

Diagnosis DeFi Inefficiencies

- The Potential of DeFi can only be realized through an iterative, long-term process:
  - diagnoses the inefficiencies in the current design (This paper)
  - finds out the underlying sources (e.g. information leakage, fee mechanisms)
  - further improves the ecosystem (e.g. better design of consensus protocols)

1. Potential Ideas & prototypes

2. Diagnosis & Evaluation

3. Better Designs

Blockchain
DeFi
This paper:

- Documents empirical regularities of the current system:
  1. centralization in mining power and wealth
  2. transition of Ethereum blockchain from a payment system to infrastructure for DeFi and other Dapps
  3. high intermediation costs for small users

- Examines the welfare impact of policies:
  1. EIP-1559 Fee Mechanism: reduce centralization
  2. Airdrop: improve financial inclusion
Wealth and Mining Centralization

- Centralization is an important concern
  - On Sept. 15, Ethereum transitioned to proof-of-stake (PoS)
  - **This paper:** Ethereum ownership is highly concentrated
  - Concentration of ownership and validation power will likely stay under PoS
    - Expected rewards and probability of being selected to append the next block are proportional to stakes
  - **Barrier for small stakers:**
    - Required minimum of 32 ETH to stake solo, otherwise stake through staking pools or centralized intermediaries (which is costly)
    - Would PoS increase concentration? Will small ETH owners become even smaller, and large owners even larger?
The paper finds that transactions on Ethereum shifted from P2P payments to Dapps.

Off-chain activity: a large portion of transactions are still processed off-chain through centralized intermediaries:

- Most transactions still go through centralized exchanges.
- The address and wallet associated with centralized exchanges have large wealth and have many transactions.
- A significant portion of miners’ rewards is earned through Flashbots, an off-chain platform for MEV auctions. (Capponi, Jia, Wang, 2021)
- How many transactions are settled off-chains? Which users use off-chain transactions more? What does it mean for financial inclusion?

Terminology: Layer-2 tokens vs ERC20 tokens?
Gas fees only depend on the complexity of the transaction.

- Borrowing 2,000 ETH and 0.002 ETH take a similar amount of gas.

**This paper:** Using Dapps or blockchains can be too expensive for smaller users, which hinders financial inclusion.

**Question:** How to reduce the cost for small users?

- Scalability is the key: Layer 2? Sharding?

**Minor suggestion:** this paper measures relative cost using \( \frac{\text{gas cost}}{\text{value}} \). Is the value of a DeFi transaction always observable?

- E.g., what is the value of a flashloan? Is it really zero? What about personal benefits?

- In table 2, the mean cost ratio of tokens is \( 5.29 \times 10^{29} \). Is the value of some transactions being underestimated?
Summary

- Very timely and interesting paper, first of its kind
- Quantify concentration and inefficiencies in Ethereum blockchain.
- Few minor comments:
  - Define the value of a DeFi transaction
  - Distribution of ownership in EOA addresses. How about Ethers in contract accounts and exchange accounts?
  - Double check table 4, columns (3) and (4), as the regression results are identical.
  - Some graphs should be better explained (e.g. Figure 6)
Thank You!