Course II:

DeFi Primitives

2. Supply and Ownership
(iii) Incentives

Incentives

Types of incentives

- Two categories of incentives: staked incentives and direct incentives
  - <u>Staked incentives</u> apply to a balance of tokens custodied in a smart contract.
  - <u>Direct incentives</u> apply to users within the system who do not have a custodied balance.

Incentives

Staking rewards

- A *staking reward* is a positive staked incentive by which a user receives a bonus in his token balance based on the stake she has in the system.

- Several verticals of incentive customization are possible:
  - Stake requirement options:
    - minimum threshold or applied to all staked balances on a pro rata basis
  - Reward options:
    - Fixed payout or pro rata payout
    - Same token type as staked or a distinct token

Incentives

Staking rewards examples

- The Compound protocol issues staking rewards on user balances that are custodied in a borrowing or lending position. These rewards are paid in a separate token (COMP) funded by custodied COMP, which has a fixed supply, and applied to all staked balances on a pro rata basis.

- The Synthetix protocol issues staking rewards on staked SNX, its protocol token which has unlimited supply. The rewards are paid in SNX, funded by inflation, and issued only if the user meets a minimum-collateralization-ratio threshold.

Incentives

Slashing

- *Slashing* is the removal of a portion of a user's staked balance, thereby creating a negative staked incentive.

- Slashing occurs as the result of an undesirable event.

- A *slashing condition* is a mechanism that triggers a slashing.

Incentives

Slashing

- Slashing customization
  - Removed funds options:
    - Complete or partial slashing
  - Slashing condition options:
    - Undercollateralization triggers liquidation
    - Detectable malicious behavior by user
    - Change in market conditions triggers necessary contraction

Incentives

Slashing example

- With collateralized loans, one slashing mechanism is liquidation
- In a liquidation, potential liquidators receive a direct incentive to execute the liquidation through auctioning or directly selling the collateral; the balance of funds remaining after the liquidation stays with the original owner.

Incentives

Direct rewards and keepers

- *Direct rewards* are positive incentives that include payments or fees associated with user actions.

- Ethereum interactions begin with a transaction, and all transactions begin with an externally owned account.

- An EOA, whether controlled by a human user or an off-chain bot, is (importantly) off chain.

- Thus autonomous monitoring of market conditions is either expensive (costs gas) or technically infeasible.

- As a result, <u>no transaction happens automatically on Ethereum</u> without being purposely set in motion.

Incentives

Direct rewards example

- The classic example of a transaction that must be set in motion is when a collateralized debt position becomes undercollateralized.

- This use case does not automatically trigger a liquidation; the EOA must trigger the liquidation.

- For this use case and others, EOAs generally receive a direct incentive to trigger the contract.

- The contract then evaluates the conditions and liquidates or updates if everything is as expected.

Incentives

Keeper

- A *keeper* is a class of EOA incentivized to perform an action in a DeFi protocol or other dApp.

- A keeper is rewarded by receiving a fee, either flat or percentage of the incented action.

- Keeper rewards may also be structured as an auction to ensure competition and best price.

- Keeper auctions are very competitive because the information available in the system is almost entirely public.

Incentives

Keeper downside

- A side effect of direct rewards for keepers is that gas prices can inflate due to the competition for these rewards.

- That is, more keeper activity generates additional demand for transactions, which in turn increases the price of gas.

Incentives

Fees

- Fees are typically a funding mechanism for the features of the system or platform.

- They can be flat or percentage based, depending on the desired incentive. Fees can be imposed as a direct negative incentive or can be accrued on staked balances.

- Accrued fees must have an associated staked balance to ensure the user pays them.

Incentives

Fees

- Given the pseudonymous anonymous nature of Ethereum accounts—all that is known about an Ethereum user is his wallet balance and interactions with various contracts on Ethereum—the imposition of fees is a design challenge.

- If the smart contract is open to any Ethereum account, the only way to guarantee off-chain enforcement or legal intervention is for <u>all debts to be backed by staked collateral</u>, which is transparent and enforceable.

- The challenges created by anonymity make other mechanisms, such as reputation, unsuitable alternatives to staked balances.

I. DeFi Infrastructure

Modules
1. Mechanics
2. Supply and Ownership
3. **Swaps and Loans**
   i. Swaps
   ii. Collateralized Loan
   iii. Flash loans
4. Joining the World of DeFi