

Crypto Lending and Borrowing in DeFi (Aave)

Interest rates (APY) for both borrowers and suppliers are calculated automatically by smart contracts, adjusting in real-time based on supply and demand dynamics within the pool

- > Lender deposits cryptoasset / stablecoin in the liquidity pool
- > Lender earns interest (APY) and receives aTokens
- > Lender can use deposit as collateral to borrow

LENDER (Supply)

- aTokens represent both the depositor's share of the liquidity pool and the increase in this value from interest earned
- Using a volatile cryptoasset as deposit and hence collateral presents the danger that a fall in value may mean the collateral may not cover the loan. In volatile markets, a stablecoin as deposit provides better investment stability

- APY is variable over time as it is dependent on demand for the (crypto)asset and its supply i.e **utilization rate**
- Utilization rate is the ratio of borrowed (crypto)asset, including accrued interest, to the total supply (deposits) of that same (crypto)asset in terms of value
- If the **Health Factor** drops below 1 due to price changes, the (crypto)asset used as collateral can be liquidated. Health factor measures the safety of a borrowing position against liquidation

Aave Protocol

- > A decentralized, non-custodial liquidity protocol where users lend and borrow cryptoassets via smart contracts, rather than directly with each other
- > The protocol uses a **liquidity pool** model where depositors add funds into a common pool, and borrowers take liquidity from that same pool
- > All transactions are automated and managed via code

$$\text{Health Factor} = (\text{collateral value} \times \text{liquidation threshold}) / \text{debt value}$$

- > Borrower deposits collateral (cryptoasset/ stablecoin)
- > Borrower uses collateral to borrow
- > Borrower pays APY on borrowed cryptoasset/ stablecoin

BORROWER (Loan)

- Borrowers deposit collateral more than the requested loan (over-collateralization)
- Amount that can be borrowed is determined by the **Loan-to-Value** (LTV) ratio, often up to 80% of the collateral value
- Thus, the amount one can borrow depends on the value of their collateral
- If the value of the collateral falls below that of the borrowed amount (and the liquidation threshold is breached) i.e the health factor falls below 1, the position is liquidated

