Providing Liquidity

Adding liquidity requires depositing an equivalent value of BASE (amountAsset) and QUOTE (priceAsset) tokens into the POOL smart contract.

The first liquidity provider to join a pool sets the initial exchange rate by depositing what they believe to be an equivalent value between BASE and QUOTE tokens. If this ratio is off, **HAMM** will bring the prices to equilibrium at the expense of the initial liquidity provider.

All future liquidity providers deposit BASE and QUOTE tokens using the exchange rate at the moment of their deposit. If the exchange rate is bad there is a profitable arbitrage opportunity that will be utilized by hAAM and the price will be corrected.

Liquidity Provider Tokens

Liquidity provider tokens (LP) are minted to track the relative proportion of total reserves that each liquidity provider has contributed. They can be used at any time to return a proportional share of the pool's liquidity to the provider.

The number of liquidity tokens minted is determined by the amounts of BASE and QUOTE tokens sent to the "put" function. It can be calculated using the equation:

$$lpToMint = currentEmissionLP * min(\frac{baseDeposited}{baseInPool}, \frac{quoteDeposited}{quoteInPool})$$

Depositing into reserves requires depositing both BASE and QUOTE tokens according to the current price at the pool smart contract.

Removing Liquidity

Providers can burn their LP at any time to withdraw their proportional share of BASE and QUOTE tokens from the pools.

$$baseWithdrawn = baseInPool * \frac{lpToBurn}{currentLpEmission}$$

$$quoteWithdrawn = quoteInPool * \frac{lpToBurn}{currentLpEmission}$$

BASE and QUOTE tokens are withdrawn at the current exchange rate (reserve ratio), not the ratio of their original investment. This means some value can be lost from market fluctuations and arbitrage.