Fully Automatic Dynamic Reward Allocation Formula (FADRA15)

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December 2, 2024

Overview

The **Fully Automatic Dynamic Reward Allocation Formula (FADRA15)** is new unique in the world mechanism for equitable reward distribution in token ecosystems. Designed to incentivize long-term holding, frequent activity, and fairness among participants, FADRA15 dynamically balances rewards, ensuring sustainability and inclusivity.

Core Formula

The reward for each participant is calculated as:

$$R_i = \max\left(0.15 \cdot T_{\text{reward}}, \min\left(T_{\text{reward}} \cdot 0.999,\ T_{\text{reward}} \cdot \frac{T_i \cdot (1 + \beta_i - \alpha_i) \cdot (1 + H_{\text{holding}}) \cdot S_{\text{activity}}}{\sum_j T_j \cdot (1 + \beta_j - \alpha_j) \cdot (1 + H_{\text{holding}}) \cdot S_{\text{activity}}}\right)\right)$$

Parameters

- $T_{\textbf{reward}}$: Total Reward Pool, dynamically updated based on transaction fees.
- $R_{\textbf{min}} = 0.15 \cdot T_{\textbf{reward}}$: Minimum reward to ensure fairness for smaller holders.
- T_i: Tokens held by participant i.
- β_i: Progressive bonus for smaller holders:

$$\beta_i = \beta_{\min} + (\beta_{\max} - \beta_{\min}) \cdot \left(1 - \frac{D_i}{D_{\max}}\right)$$

- α_i: Regressive penalty for larger holders:

$$\alpha_i = \alpha_{\min} + (\alpha_{\max} - \alpha_{\min}) \cdot \frac{D_i}{D_{\max}}$$

- $H_{\textbf{holding}}$: Holding multiplier, rewarding long-term retention:

$$H_{\text{holding}} = \min\left(\frac{t}{t_{\max}}, 1\right)$$

- $S_{\textbf{activity}}$: Activity multiplier, incentivizing frequent engagement:

$$S_{\text{activity}} = \frac{\text{UserTransactions}}{\text{AverageTransactions}}$$

Key Features

- **Dynamic Bonuses and Penalties:** Automatically adjusted based on participant size and proportional share.
- **Minimum Rewards:** Ensures smaller holders receive a fair share of rewards.
- **Sustainability:** Caps rewards at $T_{\text{reward}} \cdot 0.999$ to avoid exceeding the available pool.
- **Incentives for Activity:** Rewards participants for frequent engagement through S_{activity}.
- **Long-Term Holding Incentives:** Encourages retention with H_{holding}.

Example Scenarios

- **Small Holder:**
  - Tokens: 10, Progressive Bonus: 15%, Reward: $0.0015 \cdot T_{\text{reward}}$.
- **Large Holder:**
  - Tokens: 500, Regressive Penalty: 10%, Reward: Calculated based on holding and activity multipliers.

Use Cases

- **Decentralized Finance (DeFi):** Distribute yield rewards to liquidity providers.
- **Token Ecosystems:** Reward token holders based on their participation and activity.
- **Gaming and NFTs:** Incentivize users for holding or trading in-game assets.

Instructions for Developers

- Implement the reward distribution logic based on the FADRA15 formula.
- Ensure all parameters are dynamically calculated based on current ecosystem conditions.
- Enforce transaction limits and locking mechanisms.
- Configure fallback mechanisms for Liquidity Pool (LP) and Reward Pool management.
- Conduct thorough testing under different scenarios (low and high activity, varying reward pools).