Dynamic Reward Allocation Formula (DRAF), by RodionKB

Introduction

The Dynamic Reward Allocation Formula (DRAF) is a robust and adaptive mechanism designed to fairly allocate rewards within decentralized ecosystems. It balances fairness, sustainability, and participant incentives by dynamically adjusting rewards based on token holdings, activity levels, and holding durations.

The Formula

The core DRAF formula is as follows:

$$R_i = T_{\text{reward}} \cdot \frac{T_i \cdot \left(1 + \left(\beta_{\min} + (\beta_{\max} - \beta_{\min}) \cdot \left(1 - \frac{D_i}{D_{\max}}\right)\right) - \left(\alpha_{\min} + (\alpha_{\max} - \alpha_{\min}) \cdot \frac{D_i}{D_{\max}}\right)\right) \cdot \left(1 + \min\left(\frac{t}{t_{\max}}, 1\right)\right)}{\sum T_j \cdot \left(1 + \left(\beta_{\min} + (\beta_{\max} - \beta_{\min}) \cdot \left(1 - \frac{D_j}{D_{\max}}\right)\right) - \left(\alpha_{\min} + (\alpha_{\max} - \alpha_{\min}) \cdot \frac{D_j}{D_{\max}}\right)\right) \cdot \left(1 + \min\left(\frac{t}{t_{\max}}, 1\right)\right)}$$

Key Benefits of DRAF

- **Fair Distribution Across Participants:** Rewards are distributed proportionally based on token holdings, activity, and holding time.

- **Encouragement for Small Participants:** Progressive bonuses (β) provide additional rewards to smaller holders.

- **Balanced Rewards for Large Holders:** Regressive penalties (α) limit dominance of large holders.

- **Incentives for Long-Term Holding:** Holding time multipliers (H_{holding}) reward long-term token retention.

- **Dynamic Adaptability:** The formula adjusts dynamically to ecosystem changes, ensuring scalability and sustainability.

- **Sustainable Growth:** A portion of every transaction grows the Reward Pool automatically.

- **Activity-Based Incentives:** Participants are incentivized to stay active and engage frequently.

- **Transparency and Predictability:** Participants can predict their rewards based on clear, deterministic parameters.

Explanation of Terms

- R_i: Total reward allocated to participant i

- T_{reward}: Total Reward Pool available for distribution.

- T_i: Tokens held by participant i.

- Progressive Bonus (β):

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

- Regressive Penalty (α):

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

- Holding Time Multiplier (H_{holding}):

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

- $\sum T_j$: Total weighted tokens of all participants in the system.

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